L. Sullivan Lchr/Mech Dept extra copy not posted

TM 9-1410-250-34

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

DS AND GS MAINTENANCE MANUAL

THE NIKE-HERCULES GUIDED MISSILE (LESS THE MISSILE GUIDANCE SET)

(NIKE-HERCULES AND IMPROVED NIKE-HERCULES GUIDED MISSILE SYSTEM)

HEADQUARTERS, DEPARTMENT OF THE ARMY

DECEMBER 1965

TECHNICAL MANUAL

DS AND GS MAINTENANCE MANUAL: THE NIKE-HERCULES GUIDED MISSILE (LESS THE MISSILE GUIDANCE SET) (NIKE-HERCULES AND IMPROVED NIKE-HERCULES AIR DEFENSE GUIDED MISSILE SYSTEMS)

TM 9-1410-250-34
CHANGES No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *7 March 1966*

TM 9-1410-250-34, 1 December 1965, is changed as follows:

1. The effectivity for all material in these changes is as specified in paragraph 3.

2. Process these changes as follows:

a. Insert changes identified as "All equipment" in paragraph 3 upon receipt of change.

b. If the serial number of the materiel in use is 20308 or higher, apply all changes as indicated in paragraph 3.

c. If the serial number of the materiel in use is 20307 or lower and MWO 9-1410-250-30/11 has been accomplished, apply all changes as indicated in paragraph 3.

d. If the serial number of the materiel in use is 20307 or lower but MWO 9-1410-250-30/11 has not been accomplished, do not change the manual until such time as the modification is completed. Retain the changed pages with the transmittal sheets in the front of the manual. After modification is completed, apply changes as indicated in paragraph 3.

3. In accordance with instructions contained in paragraph 2, the attached new pages, as enumerated below, will be inserted in the manual and the old pages will be removed. The material on a new page affected by these changes is indicated by a vertical line the full length of the changed material except for revised illustrations which are indicated by a vertical line adjacent to the ORD G number.

Old pages	New pages	Effectivity	
		MWO	Production Cut-In Serial No.
3-3, 1-4	1-3, 1-4	9-1410-250-30/11	20308
3-99—3-102	3-99—3-102	9-1410-250-30/11	20308
3-111—3-114	3-111—3-114	9-1410-250-30/11	20308
3-141, 3-142	3-141, 3-142, 3-142.1		All equipment

4. Retain the transmittal sheets in the front of the manual for future reference.

By Order of the Secretary of the Army:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

Distribution:

To be distributed in accordance with DA Form 12-32, Sec II (Unclas) requirements for publications pertaining to Direct and General Support Maintenance applicable to the NIKE-HERCULES and IMPROVED NIKE-HERCULES Missile System.

☆ U. S. GOVERNMENT PRINTING OFFICE: 1966—204433/2067

TECHNICAL MANUAL
No. 9-1410-250-34

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., *1 December 1965*

THE NIKE-HERCULES GUIDED MISSILE (LESS THE MISSILE GUIDANCE SET)

*This manual supersedes TM 9-1410-250-34, 3 February 1960, including C1, 23 March 1961; C2, 5 June 1961; C3, 21 August 1961; C4, 30 August 1961; C5, 4 October 1961; C6, 20 December 1961; C7, 8 March 1962; C8, 12 July 1963; C9, 25 February 1965; and TB 9-1410-250-34/3, 20 December 1960.

CHAPTER 1

INTRODUCTION

1-1. Scope

a. This is one of a series of technical manuals (TM's) on servicing, operation, maintenance, and test of guided missiles MIM-14A (missiles 10206 through 11935) and MIM-14B (missiles 13001 and subsequent) less the missile guidance set. TM's covering these missiles are listed in appendix I of TM 9-1400-250-10/2.

b. This manual is published for the information and guidance of personnel responsible for maintenance which is beyond the scope of the tools, equipment, or supplies normally available to organizational personnel. Information which is intended primarily for organizational personnel is available to direct and general support maintenance personnel in TM 9-1410-250-12.

c. Appendix I contains a list of current references, including supply manuals (SM's), TM's, and other available publications applicable to the material. Appendix II contains a listing of the abbreviations used throughout the manual. Appendix III contains a listing of the threaded holes in guided missiles MIM-14A and MIM-14B that are most susceptible to damage, their location, description, and the recommended inserts to be used for repairing them. Appendix IV contains a cross-reference index of TM and official nomenclature for the major components of guided missiles MIM-14A and MIM-14B.

d. Information in this manual covers missiles with serial numbers from 10206 through 11935 (guided missile MIM-14A) and 13001 and subsequent (guided missile MIM-14B).

1-2. Modification Work Orders (MWO)

This manual is technically correct for guided missiles MIM-14A and MIM-14B provided all the MWO's listed and briefly described below have been incorporated.

a. ORD Y77-W5, Changes 1 and 2, installs turnlock fasteners on the forward body section for mounting the RF-test-set test adapter (missiles 10206 through 10370).

b. ORD Y77-W7 adds drain holes and seals to weatherproof the missile body for outside storage (missiles 10001 through 10838).

c. ORD Y77-W8 provides better accessibility of bolt heads at missile body station 136.000 (missiles 11001 through 11165).

d. ORD Y77-W10, Changes 1, adds plugs and gaskets to weatherproof the missile handling points and electrical cable connections (missiles 10206 through 11745, and 13001 through 13160); also, adds a plastic screw in each of the four nose-hinge attach holes in the forward warhead structure assembly (missiles 11001 through 14449).

e. ORD Y77-W11 provides for rework of the warhead body assembly (missiles 11001 through 11009, 11011 through 11015, 11017, 11020 through 11023, 11027, 11029 through 11032, 11034 through 11042, 11048, 11052 through 11058, 11064, 11070, 11074 through 11082, 11085, 11088 through 11091, 11093, 11094, 11097 through 11099, 11101 through 11103, 11105, 11108 through 11110, and 11112 through 11114).

f. ORD Y77-W13, Changes 1 and 2, repositions the boltwell cover fairing assembly for the warhead body section (missiles 10206 through 10240).

g. ORD Y77-W20 changes the washers and bolts to permit proper application of torque on bolts attaching the missile rocket motor subassembly to the motor mounting ring (missiles 10206 through 11745 and 13001 through 13160).

h. ORD Y77-W22 changes the warhead cable assembly to eliminate interference with forward main fin No. 4 (missiles 10207 through 10232 and 10234 through 10259).

i. ORD Y77-W23 adds spacers between the batteries to minimize movement within the missile battery box (10206 through 10607); also

adds additional screws to secure the lead ballast in the dummy batteries installed on selected missiles only (missiles 10206 through 10370).

j. ORD Y77-W25 changes the bolts used to join the forward body section to the warhead body section (missiles 10371 through 10406).

k. ORD Y77-W26 adds hardware to secure receptacle connector J503 of the fail-safe wiring harness to the bracket (missiles 10206 through 10907).

l. ORD Y77-W28, Changes 1, changes the umbilical cable assembly attach screws to increase the strength of attachment to the missile (missiles 10206 through 10565).

m. ORD Y77-W30, Changes 1 and 2, modifies the APS distribution box wiring harness and the APS interconnecting cable assembly to provide wiring for the APS winterization kit (missiles 10206 through 11935 and 13001 through 13683).

n. ORD Y77-W31, Changes 1, replaces the steel gaskets, used to seal the nozzle to the blast tube and the blast tube to the rocket motor, with stainless steel gaskets (missiles 10206, 10208, 10209, 10212, 10219, 10221, 10224, 10225, 10227, 10232, 10234, 10236, 10237, 10240, 10242, 10247, 10249, 10251, 10254 through 10257, 10259, 10260, 10262, 10263 through 10274, 10277 through 10338, and 10340 through 10519).

o. ORD Y77-W32, Changes 1, provides for securing the rear main fin forward-attach stud when installing or removing the associated double-hexagon nuts (missiles 10206 through 11838, and 13001 through 13450).

p. ORD Y77-W33 adds a check valve in the APS return line to prevent leakage at the actuator valves (missiles 10206 through 11935 and 13001 through 13683).

q. ORD Y77-W34 adds holding springs to the APS service door to provide an additional safety factor and for easier access to the APS service panel (missiles 10206 through 11745 and 13001 through 13160).

r. ORD Y77-W35 replaces the main fin seals and seal retainers to facilitate future seal replacement by lower categories of maintenance (missiles prior to 12289).

s. ORD Y77-W36, Changes 1, modifies the check valve port of the APS control valve assembly to incorporate an improved high-pressure check valve; affects APS 9032190 equipped with control valve body 9030837.

t. ORD Y77-W37 replaces the fuel control valves on the APS fuel manifold assembly to reduce the possibility of fuel leakage; affects APS units with serial numbers as follows: 98-827, 98-930, 98-931, 98-933 through 108-941, 108-943, 108-944, 108-946, 108-951, 108-953, 108-957, 108-959, 108-961, 108-963, 108-970, 108-971, 108-976 through 108-979, 108-984, 108-992, 108-993, 108-996, 108-1001, 108-1003, 108-1008, 108-1012, 108-1015, 108-1023, 108-1026, 108-1027, 108-1029 through 108-1031, 108-1039 through 108-1042, 108-1044 through 108-1046, 108-1049, 108-1052 through 108-1054, 108-1056 through 108-1060, 108-1070 through 108-1073, and 108-1078.

u. ORD Y77-W40, Changes 1, provides additional longeron access holes to allow replacement of the nut plates damaged by the equipment section access cover plate screws (missiles 10206 through 11935 and 13001 through 13938).

v. ORD Y77-W42 replaces the warhead-timer jumper assembly with the sequential timer to provide added capability to the missile (missiles 10206 through 11935 and 13001 through 14764).

w. ORD Y77-W43 replaces the start solenoid and stop solenoid valve assemblies to provide positive functioning of the APS hydraulic system by allowing the stop solenoid to remain open in case of mechanical failure of the start solenoid (applies to all APS units 9032190 and to APS units 9030900 with serial numbers prior to 49-2396).

x. ORD Y77-W49 relocates the safety circuit in the missile distribution box to isolate the safety circuit from the internal-external control circuit to reduce the possibility of a missile being launched without the squib voltage required (missiles 13684 through 14069).

y. ORD Y77-W50, Changes 1, replaces the control actuator assembly filters (missiles 11361 through 11935 and 13051 through 13797).

z. ORD Y77-W52 adds a terminal board assembly to the missile distribution box to minimize the possibility of a burnout of the battery charge lamp located in the launcher control-indicator (missiles 13684 through 14793 and 14965 through 14976).

aa. 9-1410-250-20/2 replaces the adjustable-type lanyard with a flexible type lanyard (mis-

siles 10206 through 11935 and 13001 through 15255).

ab. 9-1410-250-20/5 changes the fuel fill quick-disconnect coupling half on the APS to reduce failure rate (missiles 10206 through 14964 equipped with APS).

ac. 9-1410-250-20/12 provides a new blast tube closure ring for use with missiles equipped with either the modified or unmodified aft support of the rocket motor subassembly (missiles 10206 through 20805).

ad. 9-1410-250-30/1 replaces the soft pilot-valve seat in the hydraulic accumulator installed in APS 9030900 with one that is properly heat treated.

ae. 9-1410-250-30/3 adds nut plates to the elevon mechanism support structure to insure proper installation of the actuator section access door assemblies (missiles 10206 through 11935 and 13001 through 15255).

af. 9-1410-250-30/4, Changes 1, relocates receptacle connector J520 to facilitate installation of the APS winterization kits (missiles 13684 through 15547).

ag. 9-1410-250-30/9 adds a teflon plug to the splined hole in HPU pump motor 9020643 to prevent the pump drive shaft from becoming disengaged from the pump due to failure of the shaft assembly.

ah. 9-1410-250-30/11 replaces the outlet tube assembly, connecting the hydraulic pump assembly and the oil manifold assembly, components of the HPU, with an automatic shutoff valve and redesigned outlet tube assembly (missiles 14965 through 20307 and all missiles prior to 14965 equipped with an HPU).

1-3. Maintenance Allocation

In general, the prescribed maintenance responsibilities of the direct and general support technician apply as reflected in the allocation of tools and repair parts in TM 9-1410-250-35P/1/1.

1-4. Forms, Records and Reports

Refer to TM 38-750 for instructions on the use and completion of all forms required for operating and maintaining the equipment.

1-5. Reporting of Equipment Manual Improvements

The direct reporting of errors, omissions and recommendations for improving this equipment manual by the individual user, is authorized and encouraged. DA Form 2028 will be used for reporting these improvements. This form may be completed using pencil, pen, or typewriter. DA Forms 2028 will be completed by the individual using the manual and forwarded direct to: Commanding General, U. S. Army Missile Command, ATTN: AMSMI-SMPT, Redstone Arsenal, Alabama 35809.

1-6. Differences Among Models

a. General. Basic differences among models of the missile body are found in the forward body section, the equipment section, and the actuator section. Differences which directly affect direct and general support maintenance procedures are noted in *b* through *i* below. These items are covered in greater detail within the appropriate sections of this manual or in TM 9-1410-250-12.

b. Forward Body Section. On missiles 10206 through 11187, the forward nose section separates from the rear nose section at station 18.000. On missiles 11188 through 11935 and 13001 and subsequent, the forward nose section separates from the rear nose section at station 40.000. The separation point was changed in order to facilitate maintenance at the forward body section.

c. Accessory Power Supply (APS). APS 9032190 was originally installed in missiles 10206 through 10301 and APS 9030900 was originally installed in missiles 10302 through 11935 and 13001 through 14964. The two models are physically and functionally interchangeable. APS 9030900 has an improved control, redesigned service panel, rerouted fuel line, and revised cabling. The separate fuel filter of APS 9032190 is replaced by a filter which is part of the fuel valve manifold on APS 9030900. Illustrations of both models are contained in TM 9-1410-250-12. On missiles 14965 and subsequent, the gas-operated APS is replaced with a battery-powered hydraulic pumping unit (HPU).

d. (Deleted)

e. Guidance Set Batteries. On missiles 10206 through 11935 and 13001 through 13683, the transponder-control group receives electrical power from storage batteries which are installed in a battery box in the equipment section. On missiles 13684 and subsequent, the transponder-control group receives electrical power from squib-activated batteries mounted on a battery rack in the equipment section. The change to squib-activated batteries resulted in changes to the battery cable assemblies and to the internal wiring of the missile distribution box. Illustrations of the two battery configurations are contained in TM 9-1410-250-12.

f. Alinement Spacers. On missiles 10604 through 11935 and 13001 and subsequent, the alinement spacers (fig. 3-90) on the outside of the actuator section are located 10 degrees clockwise (looking forward) from the positions of the pads on missiles 10206 through 10603.

g. Blast Tube Adjustable Mounts. On missiles 10206 through 10607, a removable base (B5, fig. 3-93) supports the shoe of the blast tube adjustable mount. On missiles 10608 through 11935 and 13001 and subsequent, the removable base is replaced by a boss (A3), integral with the frame, to which the mounts attach.

h. Thermal Battery Assembly. On missiles 10206 through 10607, nine screws used in the assembly and installation of the thermal battery assembly are secured by self-locking hexagon nuts; in missiles 10608 through 11935 and 13001 and subsequent, the nine screws are secured by plate nuts incorporated in the thermal battery assembly. On missiles 10206 through 10607, a spring pin is used to secure the initiator pins to the thermal battery bracket plug; on missiles 10608 through 11935 and 13001 and subsequent, a drilled fillister-head screw is used in place of the spring pin. Illustrations of the two configurations are contained in TM 9-1410-250-12.

i. Rear Support of the Rocket Motor Subassembly. On some missiles, the supporting extension sleeve on the rear end of the rocket motor subassembly has been replaced by rocket motor support 9979156. The rocket motor support is installed as directed by MWO 9-1410-206-50/2.

siles 10206 through 11935 and 13001 through 15255).

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d. Hydraulic Pumping Unit (HPU). On missiles 20308 and subsequent, the outlet tube assembly, connected between the hydraulic pump assembly and the oil manifold assembly, is replaced with a shut-off valve and redesigned outlet tube assembly.

e. Guidance Set Batteries. On missiles 10206 through 11935 and 13001 through 13683, the transponder-control group receives electrical power from storage batteries which are installed in a battery box in the equipment section. On missiles 13684 and subsequent, the transponder-control group receives electrical power from

squib-activated batteries mounted on a battery rack in the equipment section. The change to squib-activated batteries resulted in changes to the battery cable assemblies and to the internal wiring of the missile distribution box. Illustrations of the two battery configurations are contained in TM 9-1410-250-12.

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g. Blast Tube Adjustable Mounts. On missiles 10206 through 10607, a removable base (fig. 3-106) supports the shoe of the blast tube adjustable mount. On missiles 10608 through 11935 and 13001 and subsequent, the removable base is replaced by a boss, integral with the frame, to which the mounts attach.

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MDH2000.102.084

TM 9-1410-250-34
C3

CHANGE
NO. 3

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., *13 December 1968*

DS and GS Maintenance Manual:

THE NIKE-HERCULES GUIDED MISSILE (LESS THE MISSILE GUIDANCE SET) (NIKE-HERCULES AND IMPROVED NIKE-HERCULES AIR DEFENSE GUIDED MISSILE SYSTEMS)

TM 9-1410-250-34, 1 December 1965, is changed as follows:

1. The attached new pages, as enumerated below, will be inserted in the manual and the old pages will be removed. New or changed material in these pages is identified by a vertical line in the margin of the page or by the ORD G number of the illustrations. Extensively changed or added sections, paragraphs, tables, etc., are indicated by a vertical line by the title only.

Remove pages	Insert pages
i, 2-1, 2-2	i, 2-1, 2-2
3-3—3-6	3-3—3-6, 3-6.1
3-31—3-34	3-31—3-41, 3-34.1
3-41, 3-42	3-41, 3-42
3-57—3-60	3-57—3-60
3-65, 3-66	3-65, 3-66
3-75—3-82	3-75—3-82
3-85, 3-86	3-85, 3-86, 3-86.1
3-91, 3-92	3-91, 3-92
3-95—3-100	3-95—3-100
3-109, 3-110	3-109, 3-110
3-111, 3-112	3-111, 3-112
3-115—3-117	3-115—3-117
3-118	3-118, 3-118.1
3-119—3-124	3-119—3-124
3-135—3-138	3-135—3-138
3-161, 3-162	3-161, 3-162
	5-1—5-12
III-1, III-2	III-1, III-2
11	11

2. Retain this transmittal sheet in the front of the manual for future reference.

a

By Order of the Secretary of the Army:

W. C. WESTMORELAND,
General, United States Army,
Chief of Staff.

Official:

KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

Distribution:

To be distributed in accordance with DA Form 12-32, Section II, direct and general support maintenance requirements for the NIKE-HERCULES and IMPROVED NIKE-HERCULES missile systems.

☆ U. S. GOVERNMENT PRINTING OFFICE: 1968—844430/658

CHAPTER 2

TOOLS AND EQUIPMENT

2–1. General

Tools, equipment, and maintenance parts, in addition to those available to the using organization, are supplied to direct and general support maintenance units for maintaining and repairing guided missiles MIM–14A and MIM–14B.

2–2. Maintenance Parts

Maintenance parts for guided missiles MIM–14A and MIM–14B are listed in TM 9–1410–250–15P/1/1, the authority for requisitioning replacement parts within the scope of direct and general support maintenance personnel.

2–3. Common Tools and Equipment

Standard and commonly used tools and equipment having general application to this materiel are authorized for issue by tables of allowances (TA) and tables of organization and equipment (TOE).

2–4. Special Tools and Equipment

a. Special tools and equipment are listed in table 2–1. This table contains only those special tools and equipment authorized to direct and general support maintenance personnel that are necessary to perform the procedures in this manual. It is provided for information only and is not to be used as a basis for requisitioning. For requisitioning, refer to SC 4935–92–CL–011.

b. Special tools and equipment used in servicing and testing the hydraulic pumping unit (HPU), the accessory power supply (APS), the control system actuator assemblies, and the missile component wiring harnesses are contained in TM 9–1410–250–35/2.

Table 2–1. Special Tools and Equipment

Item	Identifying No.	Use
Adapter, transporter, missile body or rocket motor cluster	8166431	Handling missile body or rocket motor cluster
Beam, hoist, HERCULES missile body	9032222	Handling missile body
Beam, hoist, missile rocket motor	8524366	Handling missile rocket motor subassembly
Beam, hoist, rear body section	9032221	Handling rear body section
Beam, hoist, warhead body section	9032265	Handling warhead body section
Cutting tool, hole rework	9979208	Used with hole rework drilling fixture 9979206
Drilling fixture, hole rework	9979206	Drilling out elongated boltwell frame attach holes in the frame of the forward body section at station 87.500.
Fixture, APS	8523723	Holding APS or HPU for maintenance and checkout
Gage, depth, dial indicator	57163 -model 643J	Measure depth of scratches on missile
Hoist, forward body section	9028230	Handling forward body section
Rack, storage, fin	8523729	Storing of fins
Segment, handling ring, HERCULES	8166877	Supporting and handling missile body or rear body section
Sling, hoist, blast tube	9032132	Handling blast tube nozzle assembly

Table 2-1. Special Tools and Equipment—Continued

Item	Identifying No.	Use
Tester, insulation resistance	ZM-21A/U	Measuring insulation resistance
Truck, body, missile	9031081	Transporting missile body
Truck, forward body section	8524460	Transporting forward body section
Truck, rear body section, missile	8523726	Transporting missile rear body section
Truck, rocket motor cluster	8166430	Assembling and transporting rocket motor cluster
Unit, hoisting, portable	9030280	Hoisting and moving missile body and rocket motor cluster components

2-5. Fabricated Tools

a. The ram-pressure probe alinement template is the only fabricated tool required by direct and general support units for normal maintenance of guided missiles MIM-14A and MIM-14B. Fabricate the template as outlined in (1) and (2) below.

(1) Using plywood, aluminum, or plastic scrap, fabricate the template as shown in figure 2-1.

(2) Position the ram-pressure probe alinement template (fig. 3-9) over the forward fin assembly, 6 inches forward of the rear saddle, and check that there is a close fit between the template and the forward fin assembly. If the template does not fit closely, hand-sand the template until a close fit is obtained.

b. A switch-bracket mounting-hole template, eight micro-switch clamps, a test gage assembly, a test shim assembly, and a feeler gage are the fabricated tools required by direct and general support units that prepare guided missiles MIM-14A and MIM-14B for practice firings. Fabricate the tools as outlined below.

(1) *Switch-bracket mounting-hole template.*

(*a*) Fabricate the two pieces of the template from 1/8-inch and 1/16-inch sheet steel stock as indicated in figure 2-2.

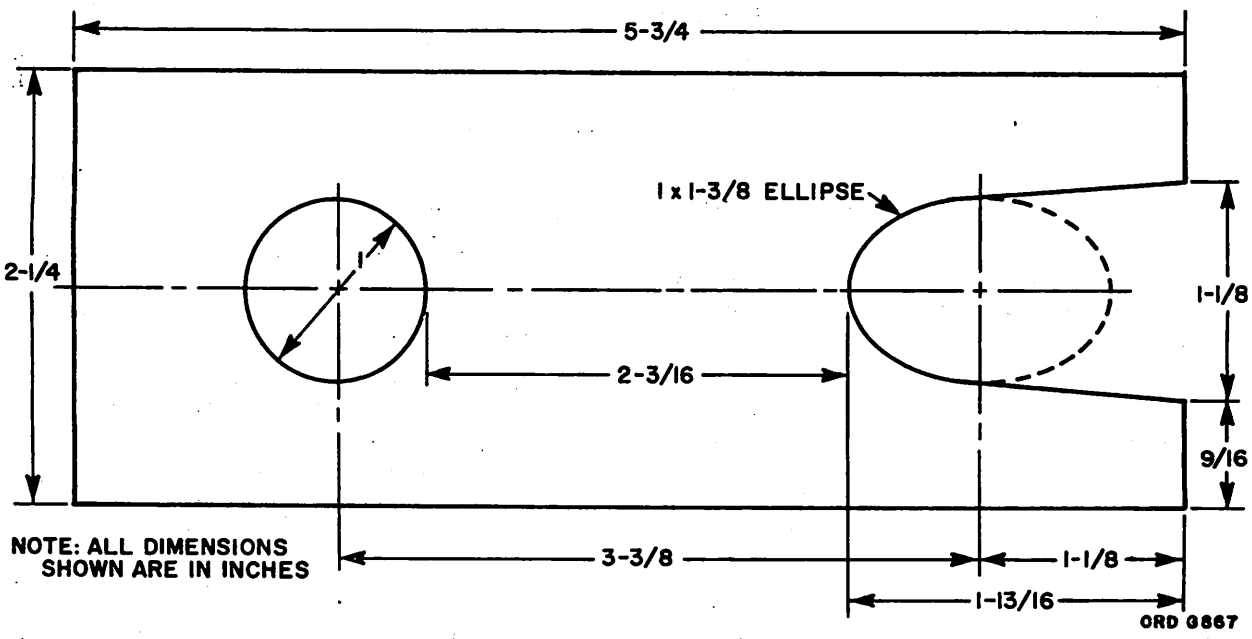


Figure 2-1. Fabrication of the ram-pressure probe alinement template.

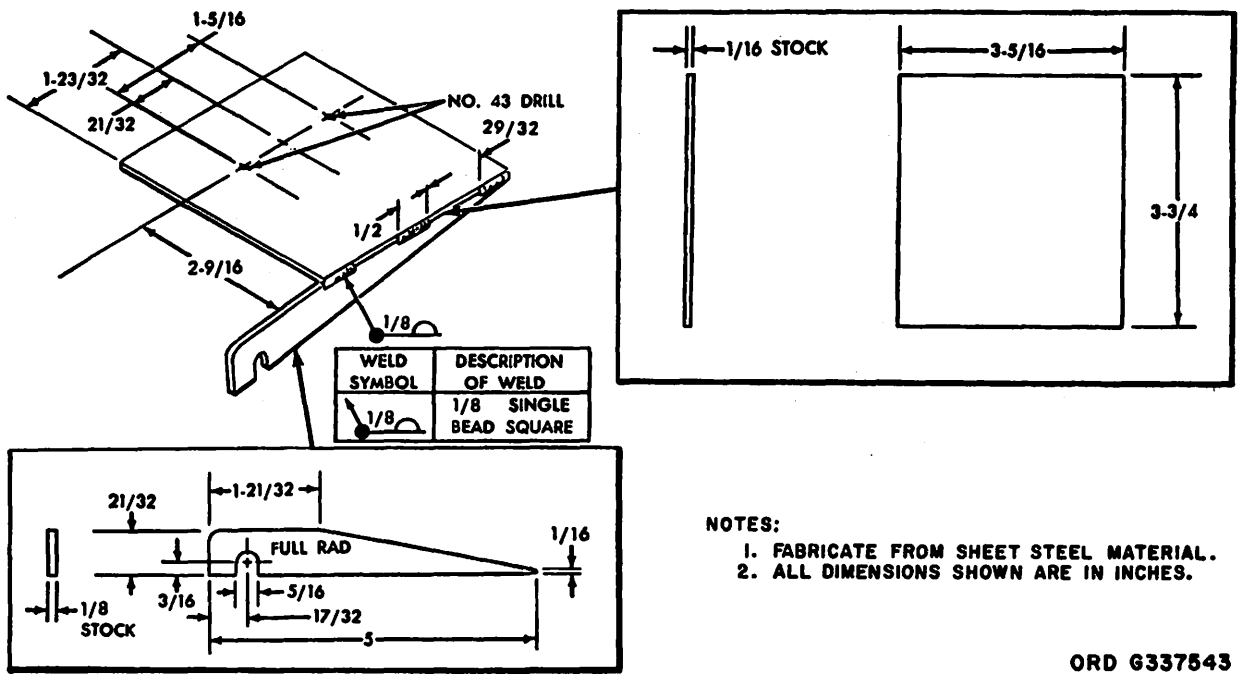


Figure 2-2. Fabrication of the switch-bracket mounting-hole template

(*b*) Join the two pieces of the template with a 1/8-inch single bead square weld, 1/2-inch long, at three equally spaced points along the joint.

(*c*) Remove all burs. Check to be sure the two pieces are properly alined, and correct any warping.

Note. The following step requires the utmost care and accuracy in its performance. Dimensions must conform to the requirements specified in figure 2-2 and should be checked after fabrication of the template and at frequent and regular intervals afterwards.

(*d*) Layout, mark, and drill the two holes in the template as indicated in figure 2-2, using a No. 43 drill bit.

(2) *Micro-switch clamp.*

(*a*) Fabricate eight micro-switch clamps from aluminum-alloy sheet stock material as indicated in figure 2-3.

(*b*) Layout, mark, and drill one hole in each clamp in accordance with figure 2-3, using a No. 2 drill bit.

(*c*) Remove all burs from each clamp.

(3) *Test gage assembly.*

Note. The following steps require the utmost care and accuracy in their performance. Dimensions must conform to the requirements specified in figure 2-4 and should be checked after fabrication of the gage.

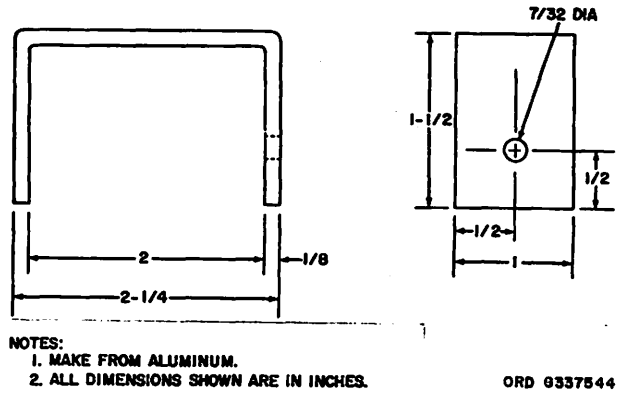


Figure 2-3. Fabrication of the micro-switch clamp.

(*a*) Fabricate the block of the test gage from CRES, type 303, bar stock material.

(*b*) Layout, mark, drill, and tap two screw holes in the block using a No. 33 drill bit and a 6-32UNC-2B thread tap.

(*c*) Fabricate the retainer of the test gage from CRES, type 303, 0.093-inch-thick sheet material.

(*d*) Layout, mark, and drill two screw holes in the retainer, using a No. 7 drill bit, as indicated in figure 2–4.

(*e*) Remove all burs from the block and retainer.

(*f*) Attach the retainer to the block using two screws, two flat washers, and two lockwashers as shown in figure 2–4.

(4) *Test shim assembly.*

Note. The following steps require the utmost care and accuracy in their performance. Dimensions must conform to the requirements specified in figure 2–5 and should be checked after fabrication of shims.

(*a*) Layout and machine the two sections of the test shim assembly from CRES, type 321, 0.125–inch-thick sheet material.

(*b*) Layout and mark three bolthole locations on the 5/8–inch section.

(*c*) Clamp the two sections together. Check to be sure the sections are properly alined with each other. Using a No. 9 drill bit, drill the three holes marked in step (4) (*b*) above through both sections.

(*d*) Remove all burs from both pieces.

(*e*) Join the two pieces together using the three bolts, three flat washers, and three nuts indicated in figure 2–5.

(5) *Feeler gage.*

Note. The following step requires the utmost care and accuracy in its performance. Dimensions must conform to the requirements specified in figure 2–6 and should be checked after fabrication of the gage.

(*a*) Layout and machine the feeler gage from CRES, type 321, 0.125–inch-thick sheet stock material.

(*b*) Remove all burs from the feeler gage.

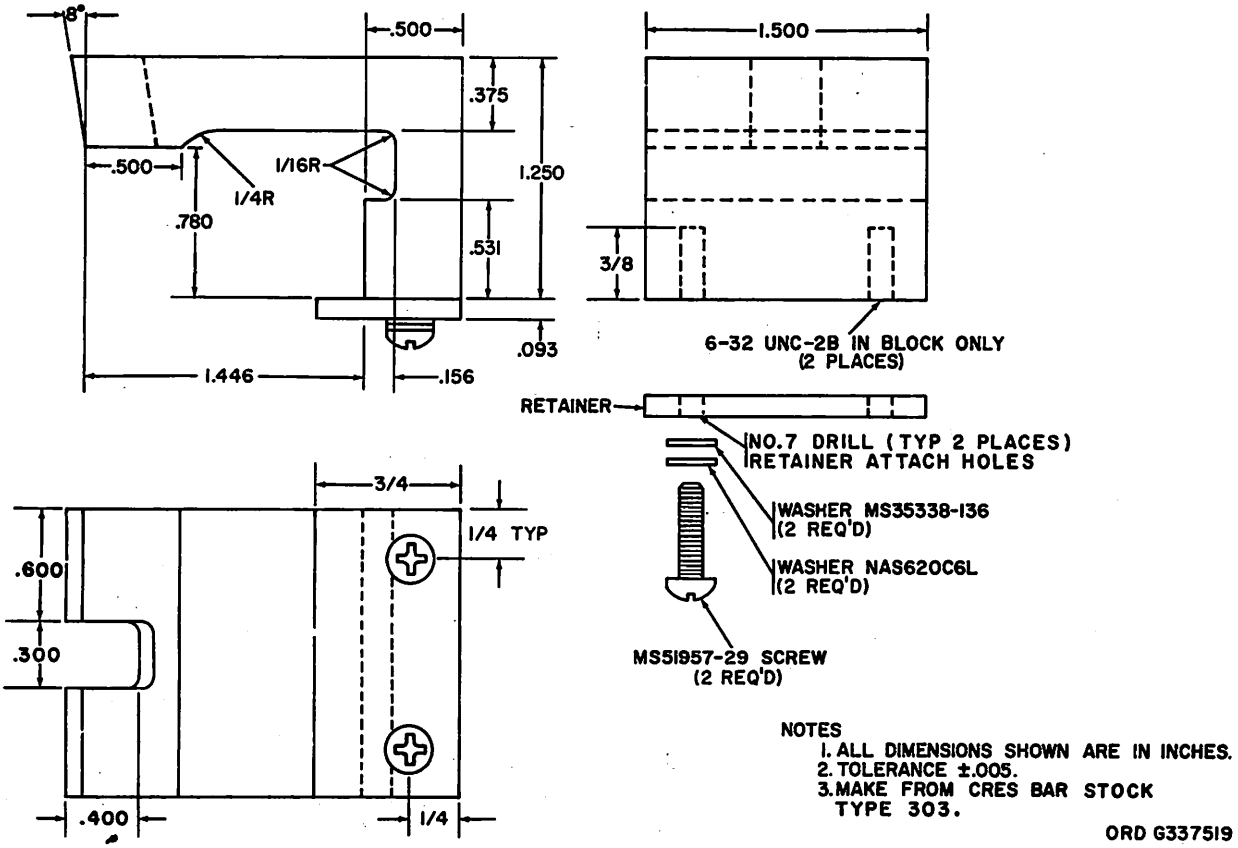


Figure 2–4. Fabrication of the test gage assembly.

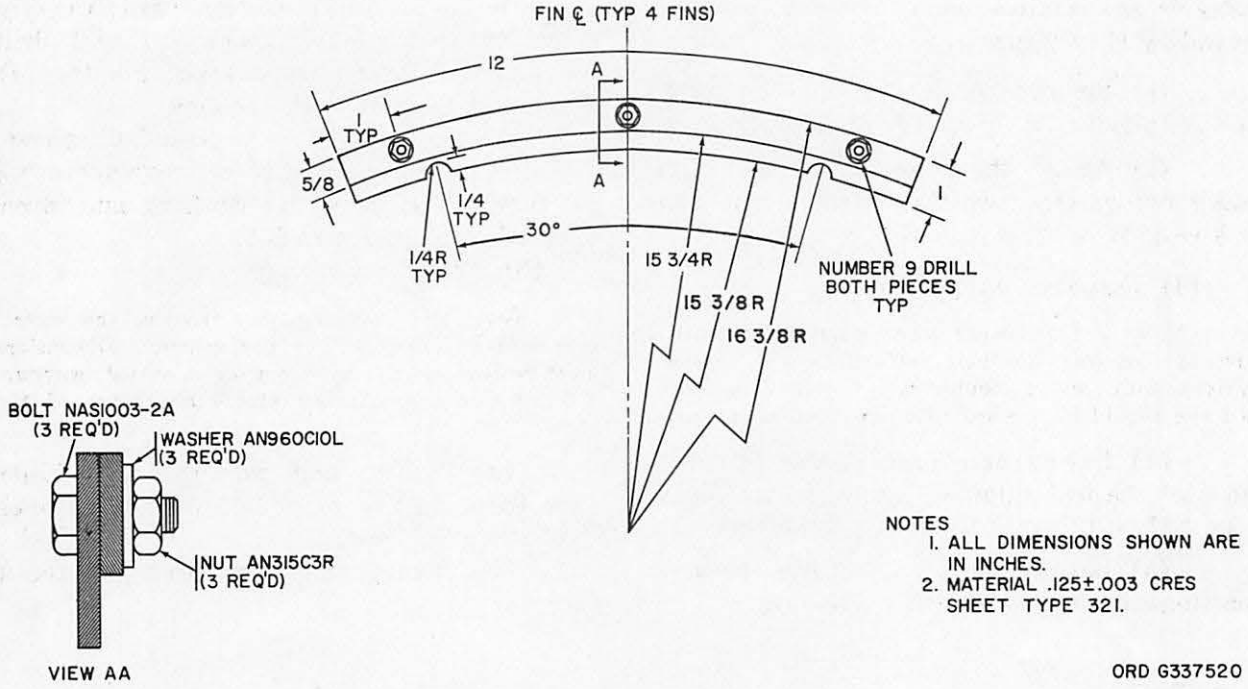
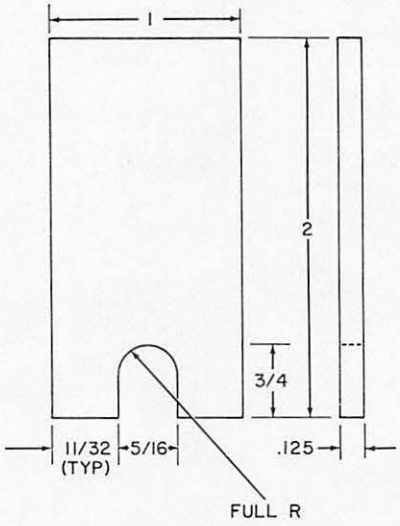


Figure 2–5. Fabrication of the test shim assembly.



NOTE:
1. ALL DIMENSIONS SHOWN ARE IN INCHES.
2. MATERIAL .125±.003 CRES SHEET TYPE 321.

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Figure 2–6. Fabrication of the feeler gage.

CHAPTER 7

MAINTENANCE OF LAUNCHING-HANDLING RAIL

Section I. GENERAL

103. Scope

This chapter contains maintenance information covering the launching-handling rail (fig. 218) that is within the scope of field maintenance personnel. The scope of field maintenance is determined by the listing of field maintenance parts in TM 9-1440-250-35P/1 and the listing of special tools for field maintenance personnel in Department of the Army Supply Manual 9-4-4935-J29-4.

104. References

Organizational maintenance of the launching-handling rail is covered in TM 9-1440-250-20. Schematic diagrams are furnished in TM 9-1440-251-20 and wiring diagrams are provided in TM 9-1440-250-35. General maintenance procedures are given in Chapter 4. Individual references to Chapter 4 are not made within this chapter. It is therefore especially important that personnel become familiar with the contents of Chapter 4.

105. General Precautions

The precautions in *a* and *b* below must be observed when performing any maintenance on the launching-handling rail.

a. Disconnect the launching-handling rail electrically from the launcher erecting beam or the loading rack test station by disconnecting the two rail power cable assemblies (fig. 224) and connecting them to the two connector shells provided on the rail.

b. When the launching-handling rail (fig. 4) is installed on a HERCULES monorail launcher, check that the MISSILE HYDR switch on the launcher control-indicator is in the OFF position and that the LAUNCHER switch is in the DOWN position.

Section II. MAINTENANCE OF LAUNCHING-HANDLING RAIL BODY

106. General

This section describes maintenance of the cover assembly (fig. 219), four guard assemblies, and two cover disks. The general precautions described in paragraph 105 must be observed when performing any maintenance on these items.

107. (Deleted)

108. Cover Assembly

A cover assembly (fig. 219) is attached to the right side of the rail body in front of the front guard assembly.

a. Removal. Remove cover assembly and gasket.

b. Installation. Install rubber and cork gasket and cover assembly.

c. Replace broken studs with cap screw MS35298-8, self-locking nut 9033925, and rivet AN427-3-6 as prescribed in (1) through (4) below.

(1) Using the cover assembly as a template, drill out the broken stud with a 5/16-inch drill bit.

(2) Remove the cover assembly and center the nut over the hole, using the cap screw to hold it in place.

(3) Using the nut as a template, drill the two rivet holes with a 7/64-inch drill bit. Remove all the burrs from the holes.

(4) Attach the nut to the rail with two 3/32-inch rivets.

109. Guard Assembly

Two front and two rear guard assemblies (fig. 219) are mounted on the four outriggers (fig. 218) on the rail body.

a. Removal. Remove guard assembly (fig. 219).

b. Installation. Install guard assembly.

110. Cover Disk

Two cover disks (fig. 219) are mounted on the rear end of the rail body on rail units 1081 through 1594.

a. Removal. Remove disk.

b. Installation. Install cover disk.

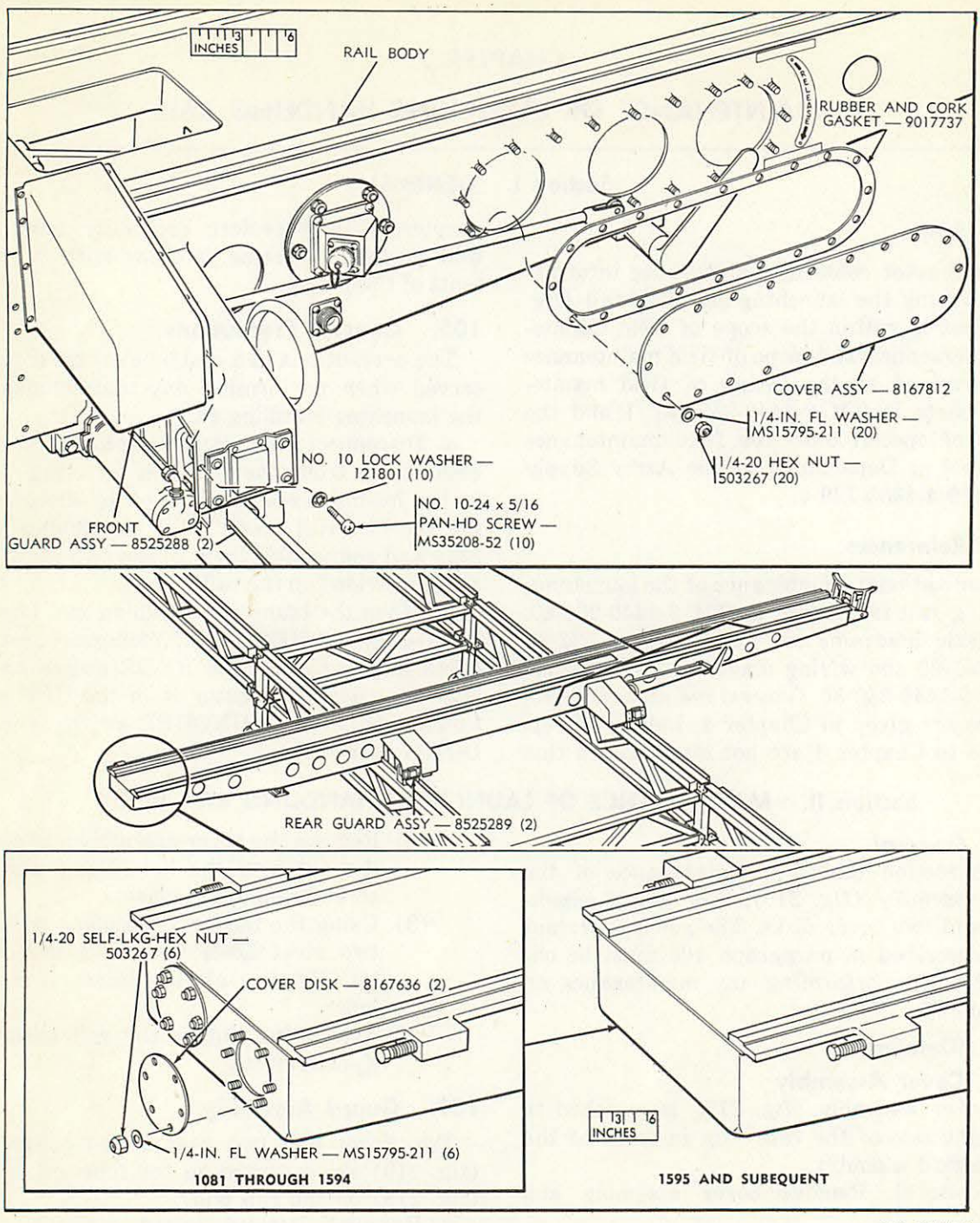

Figure 219. Guard assembly, cover disk, and cover assembly—removal and installation.

Section III. MAINTENANCE OF LAUNCHING-HANDLING RAIL ELECTRICAL SYSTEM

111. General

This section describes maintenance of the components of the launching-handling rail electrical system. The general precautions described in paragraph 105 must be observed when performing maintenance on these items.

112. Missile-Away Switch

The missile-away switch (fig. 220), mounted on the left rear of the launching-handling rail includes a missile-away cable assembly which extends to the terminal board group (fig. 218).

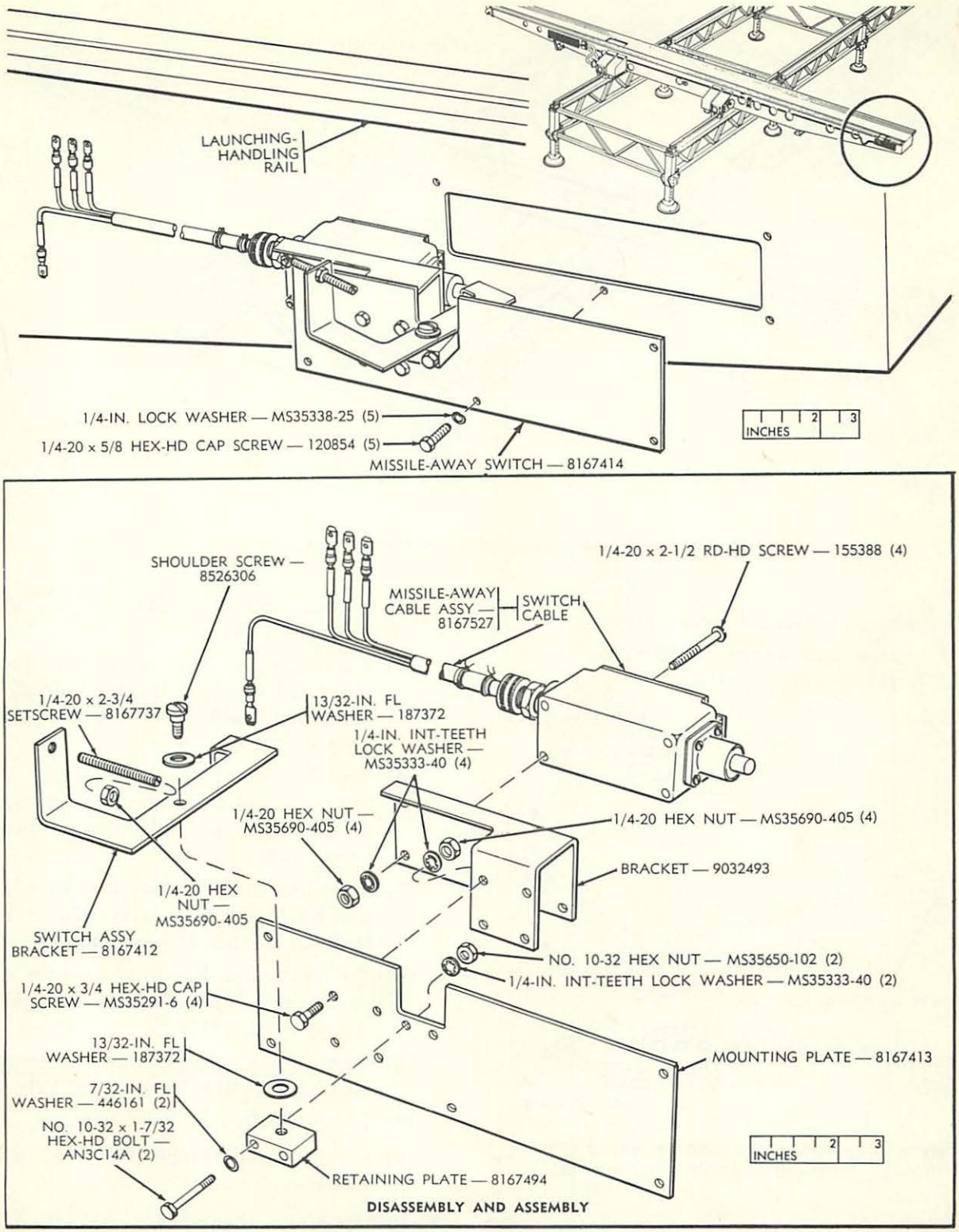

Figure 220. Missile-away switch (1090 and subsequent) — removal and installation.

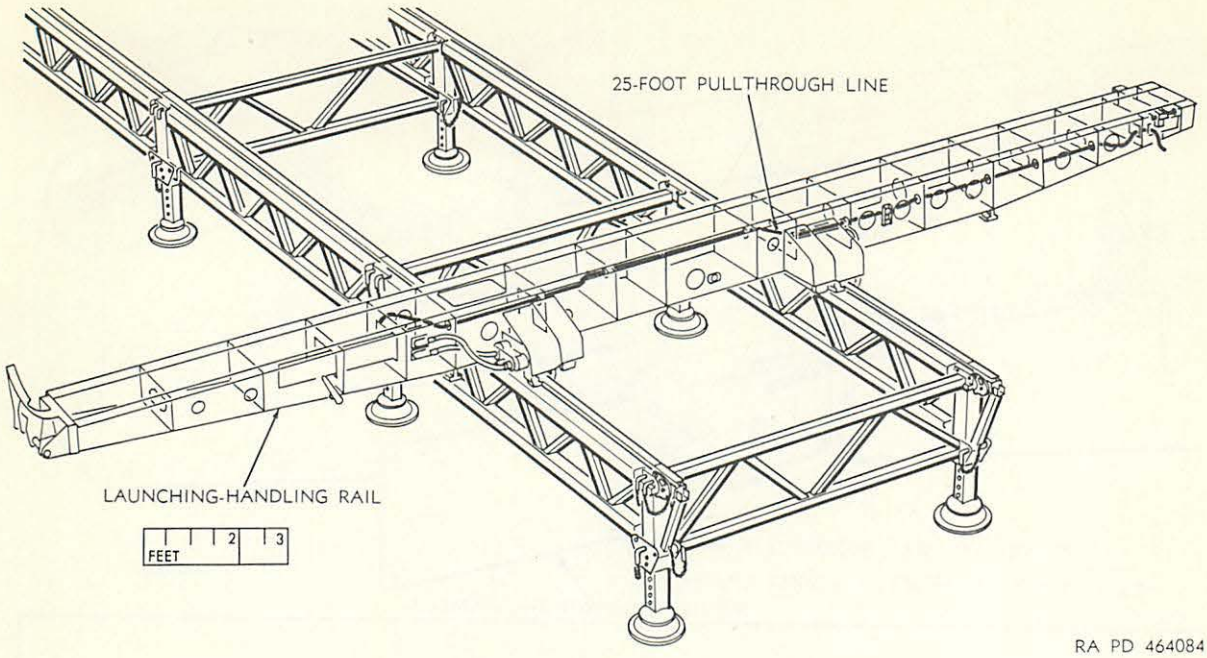

Figure 221. Missile-away switch—pullthrough line location.

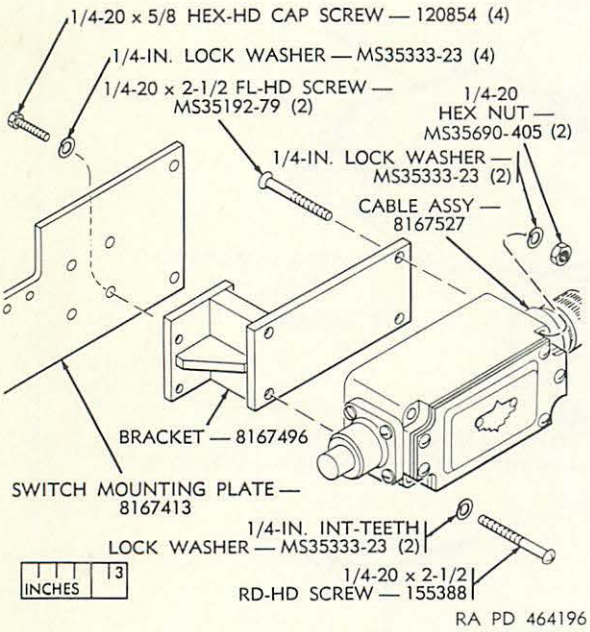

Figure 222. Missile-away switch assembly (1081 through 1089)—disassembly and assembly.

a. Removal.

(1) Remove the cover assembly (fig. 219).

(2) Loosen connector assembly in bulkhead (fig. 223).

(3) Tape one end of a 25-foot pullthrough line (fig. 221) approximately 18 inches back from first terminal breakout point.

(4) Tie line in half-hitches (fig. 84) around cable assembly three or four times, spacing half-hitches three inches apart.

(5) Tape line to cable assembly after last half-hitch and tape terminals to line to form a taper at terminal end.

(6) Tie free end of line to any convenient part of rail to prevent accidental pullthrough (fig. 221).

(7) Remove five hexagon-head cap screws attaching switch to rail (fig. 220).

(8) Remove switch.

(9) Separate pullthrough line from cable assembly, leaving line in rail.

b. Disassembly. Disassemble switch (fig. 220) or switch assembly (fig. 222).

c. Assembly. Assemble switch (fig. 220) or switch assembly (fig. 222).

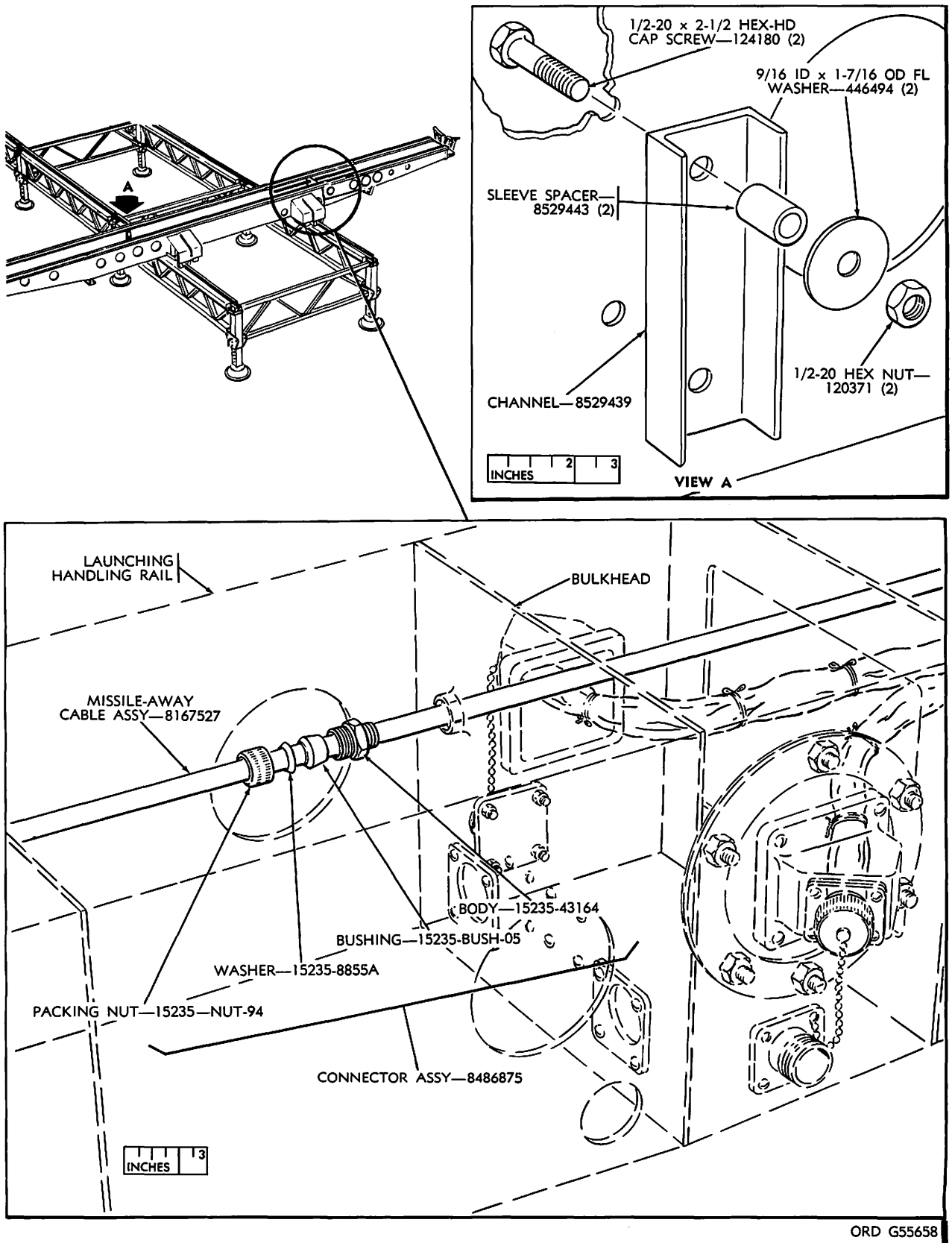

Figure 223. Missile-away cable assembly and channel—removal and installation.

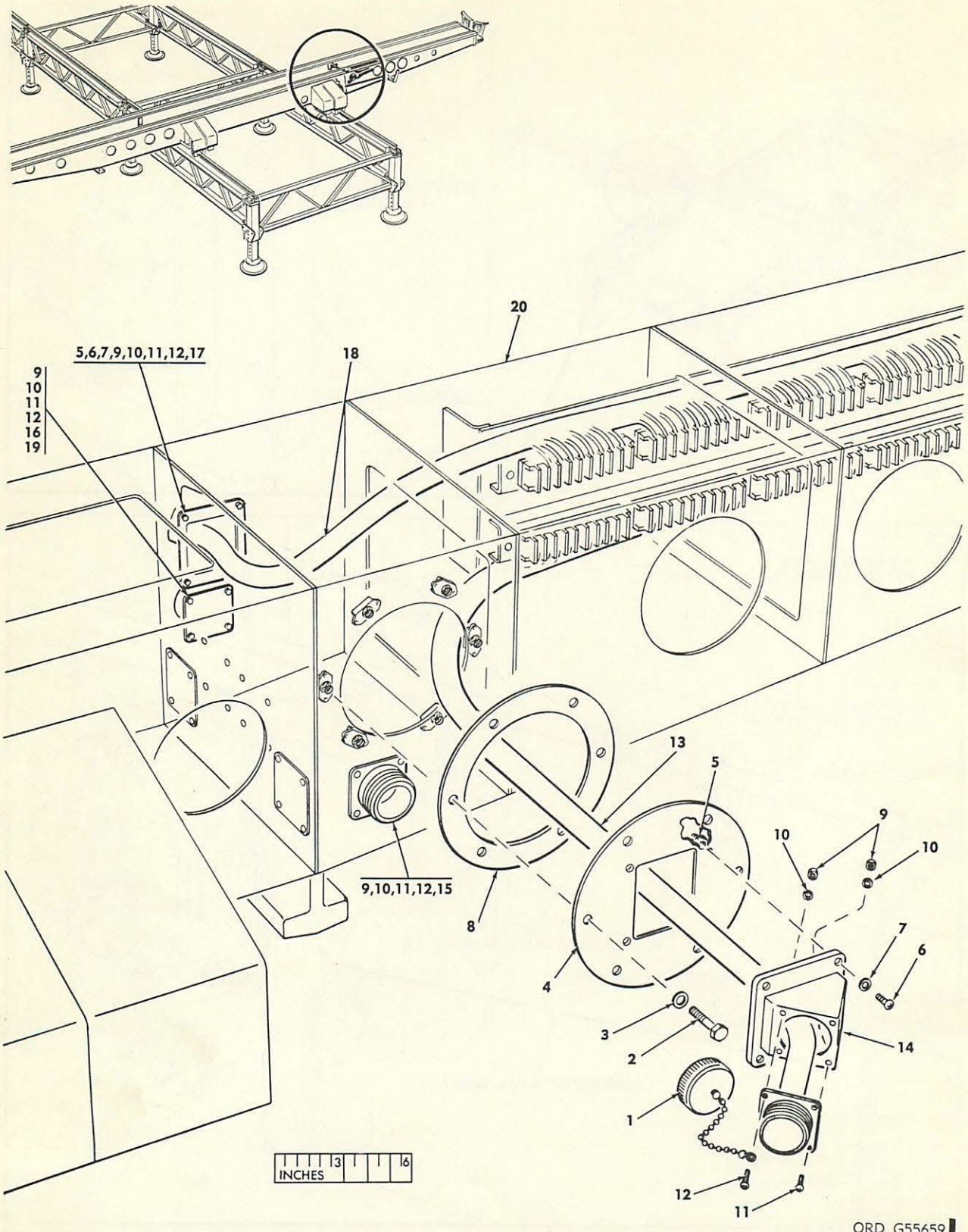

Figure 223.1. Missile umbilical cable assemblies, cover plate, and conduit outlet covers—removal and installation.

1—Electrical connector cover—8527392
2—¼-28 hexagon-head cap screw—MS35298-8 (6)
3—¼-inch flat washer—MS15795-211 (6)
4—Cover plate—9152160
5—No. 10-32 hexagon nut—NAS697A3 (4)
6—No. 10-32 x ¾ round-head screw—AN520-10R12 (4)
7—0.203 id x 0.438 od nonmetallic washer—NAS549L10 (4)
8—Rubber and cork gasket—9017736
9—No. 8-32 hexagon nut—MS35649-84
10—No. 8 flat washer—AN960-8L (18)
11—No. 8-32 x ⅝ round-head screw—132764 (3)
12—No. 8-32 x ¾ round-head screw—155053
13—Missile umbilical cable assembly—8167393
14—Conduit outlet cover—49367-P100123
15—Shell—9003236
16—Cover—8192540
17—Conduit outlet cover—49367-P100122
18—Missile umbilical wiring harness assembly—8167388
19—Dummy connector—8527473
20—Launching-handling rail

Figure 223.1. Missile umbilical cable assemblies, cover plate, and conduit outlet covers—removal and installation—legend.

d. Installation.

(1) Use pullthrough line in launching-handling rail to tie three or four half-hitches (fig. 84) approximately 18 inches back from end of missile away cable assembly (fig. 220).

(2) Tape end of line to cable assembly.

(3) Tape terminals to line to form a taper at terminal end.

(4) Pull cable assembly through rail (fig. 221), remove tape, and untie line.

(5) Refer to TM 9-1440-250-35 and make proper wire connections.

(6) Install cover assembly (fig. 219).

(7) Tighten connector assembly (fig. 223).

(8) Install switch on rail (fig. 220).

e. Adjustment. Adjust switch as described in TM 9-1440-250-20.

113. Missile Umbilical Cable Assemblies

Note. The key numbers shown in parentheses in this paragraph refer to figure 223.1 unless otherwise indicated.

The missile umbilical cable assembly (13) and missile umbilical wiring harness assembly (18) are located inside the launching-handling rail (20). Both provide for external connections at conduit outlet covers (14 and 17).

a. Removal.

(1) Remove cover assembly (fig. 219).

(2) Remove conduit outlet cover (14) and cover plate (4).

(3) Disconnect electrical leads from terminal blocks and remove missile umbilical cable assembly (13).

(4) Remove conduit outlet cover (17).

(5) Disconnect electrical leads from terminal blocks and remove missile umbilical wiring harness assembly (18).

b. Installation.

(1) Install conduit outlet cover (17) on missile umbilical wiring harness assembly (18).

(2) Install harness assembly (18).

(3) Install conduit outlet cover (14) on cover plate (4) and install on missile umbilical cable assembly (13).

(4) Install cable assembly (13).

(5) Refer to TM 9-1440-250-35 and make proper wiring connections.

(6) Install cover assembly (fig. 219).

114. Rail Power Cable Group

Two rail power cable assemblies (fig. 224), in their stowed position, are attached to the connector shells on the front left outrigger (fig. 218). They extend into the launching-handling rail through the conduit outlet covers (fig. 224) and forward to the terminal board group (fig. 218). Typical replacement procedures for either cable assembly are described in *a* through *d* below.

a. Removal.

(1) Remove cover assembly (fig. 219).

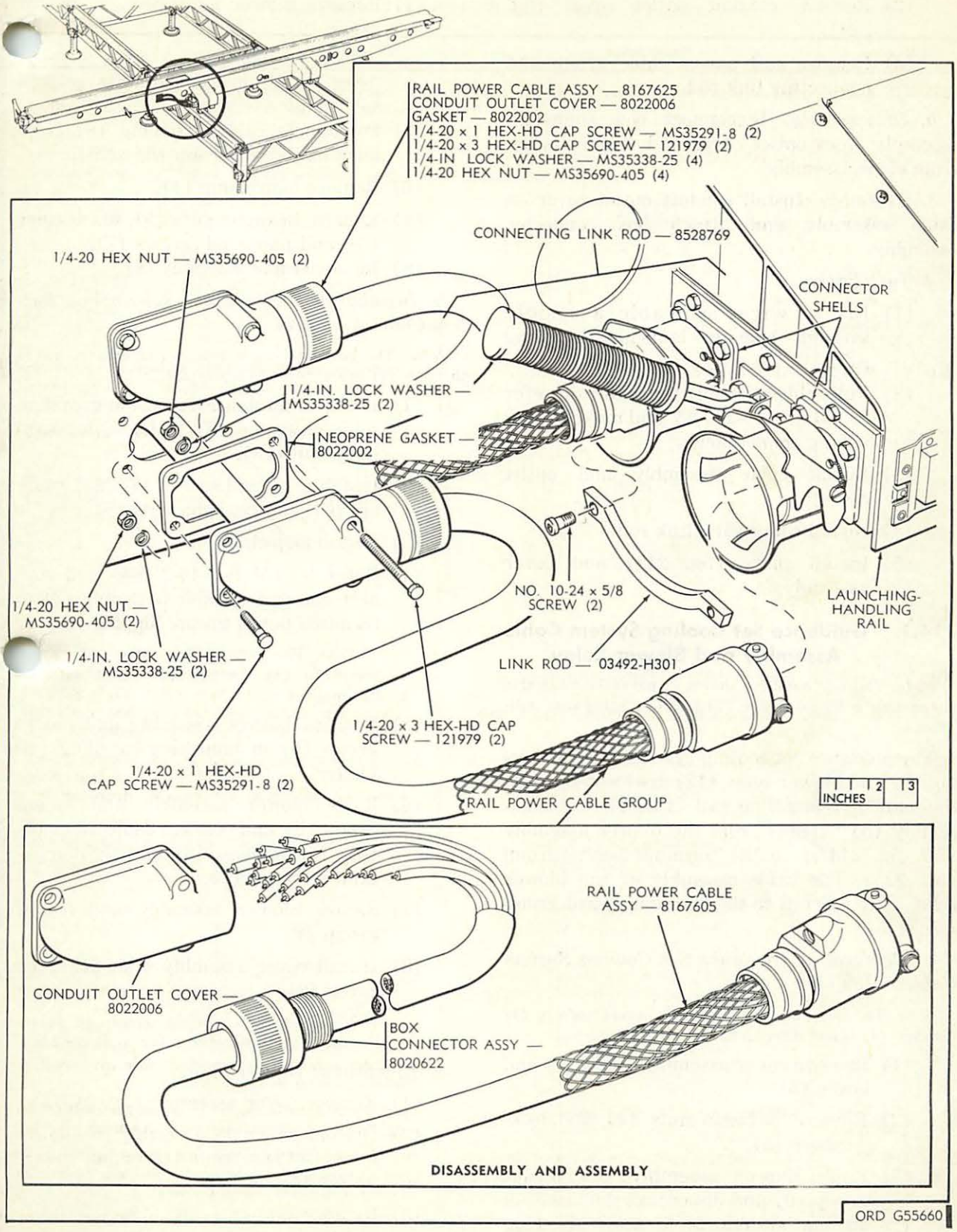

Figure 224. Rail power cable group – removal and installation.

(2) Remove conduit outlet cover (fig. 224).

(3) Remove rail power cable group and connecting link rod.

b. Disassembly. Disconnect box connector assembly from outlet cover and remove outlet from cable assembly.

c. Assembly. Install conduit outlet cover on cable assembly and attach box connector assembly.

d. Installation.

(1) Insert wires of cable assembly through hole in launching-handling rail.

(2) Pull cable assembly through rail, refer to TM 9-1440-250-35, and make proper wiring connections.

(3) Install cable assembly and outlet cover.

(4) Install connecting link rod.

(5) Install plate (fig. 219) and cover assembly.

114.1. Guidance Set Cooling System Cable Assembly and Blower Relay

Note. The key numbers shown in parentheses in this paragraph refer to figure 224.1 unless otherwise indicated.

The guidance set cooling system cable assembly (8) and blower relay (12) are located inside the launching-handling rail (13). The cable assembly (8) extends from the blower assembly (9D, fig. 244.1) to the terminal board group (fig. 225). The cable assembly of the blower relay (12) extends to the terminal board group (fig. 225).

a. Removal of Guidance Set Cooling System Cable Assembly.

Note. The key numbers shown in parentheses in (1) through (4) below refer to figure 244.1.

(1) Remove cover assembly (fig. 219) and cover (3).

(2) Remove hexagon nuts (4) and lockwashers (5).

(3) Raise blower assembly and mount group (9) and disconnect guidance set cooling system cable assembly (6); loosen retaining bands (7).

(4) Remove blower assembly and mount group (9).

Note. The key numbers shown in parentheses in (5) through (8) below refer to figure 224.1.

(5) Disconnect cable assembly (8) from terminal board group (fig. 225).

(6) Remove loop clamp (4).

(7) Remove hexagon nuts (5), flat washer (6), and pan-head screws (7).

(8) Remove cable assembly (8).

b. Installation of Guidance Set Cooling System Cable Assembly.

Note. The key numbers shown in parentheses in (1) through (4) below refer to figure 224.1.

(1) Position guidance set cooling system cable assembly (8) in launching-handling rail (13).

(2) Install pan-head screws (7), flat washers (6), and hexagon nuts (5).

(3) Install loop clamp (4).

(4) Refer to TM 9-1440-250-35 and connect one end of cable assembly (8) to terminal board group (fig. 225).

Note. The key numbers shown in parentheses in (5) through (8) below refer to figure 244.1.

(5) Position blower assembly and mount group (9) in launching-handling rail (10).

(6) Raise blower assembly and mount group (9) and connect cable assembly (6); install hose (8) and tighten retaining bands (7).

(7) Secure blower assembly and mount group (9).

(8) Install cover assembly (fig. 219) and cover (3).

Note. The key numbers shown in parentheses in *c* and *d* below refer to figure 224.1.

c. Removal of Blower Relay.

(1) Remove cover assembly (fig. 219).

(2) Disconnect cable assembly of blower relay (12) from terminal board group (fig. 225).

(3) Remove blower relay (12).

d. Installation of Blower Relay.

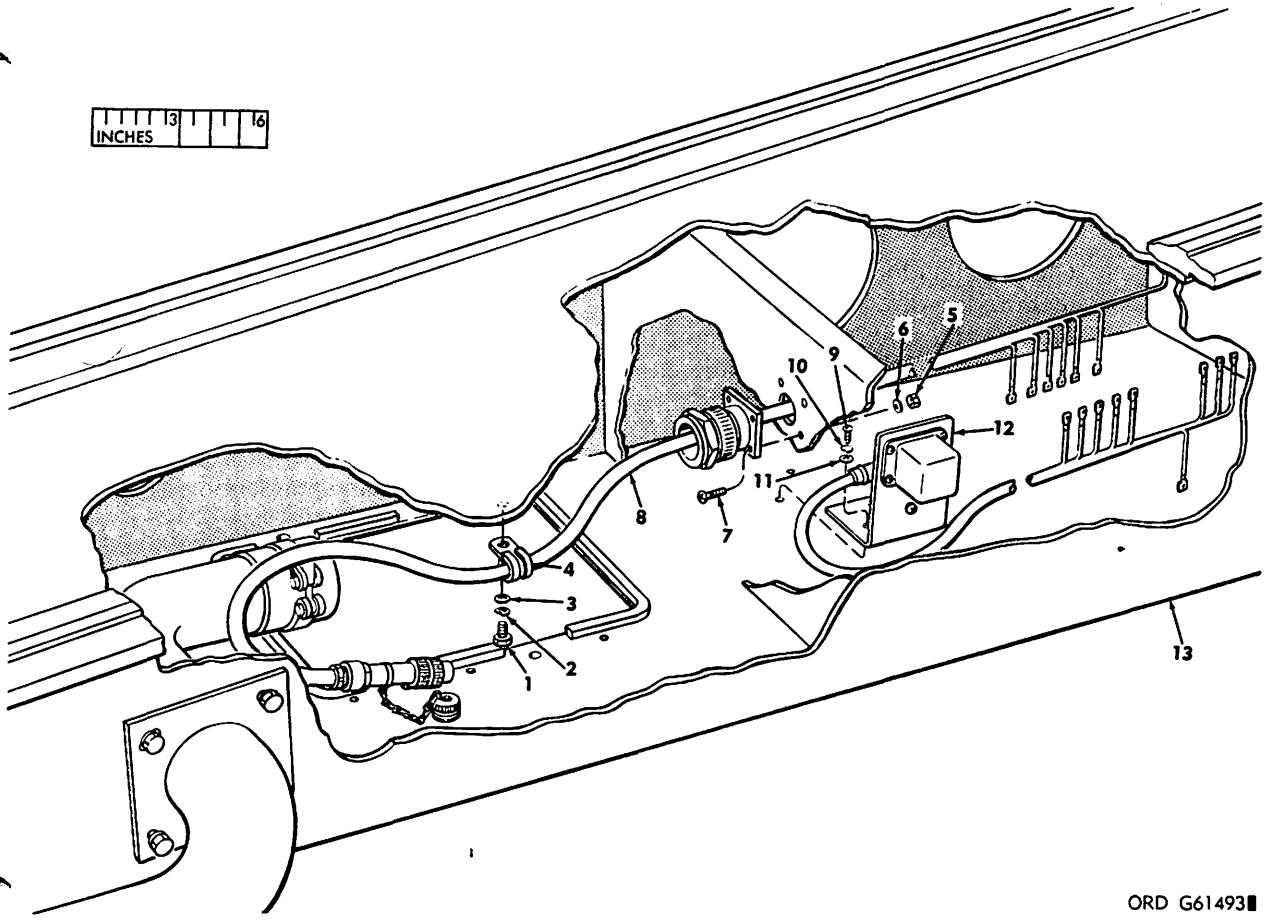

Figure 224.1. Guidance set cooling system cable assembly and blower relay — removal and installation.

1—No. 10-32 x 0.464 hex-hd shear bolt NAS1103-3
2—No. 10 lockwasher MS35338-43
3—No. 10 fl washer MS15795-208
4—Loop clamp MS21919G10
5—No. 10-32 self-locking hex nut NAS1021N3 (4)
6—No. 10 fl washer MS15795-208 (4)
7—No. 10-32 x ⅞ pan-hd screw MS35207-58 (4)
8—Guidance set cooling system cable assembly 8521462
9—No. 10-32 x ½ truss-hd screw MS35208-55 (3)
10—No. 10 lockwasher MS35338-43 (3)
11—No. 10 fl washer MS15795-208 (3)
12—Blower relay 8521464
13—Launching-handling rail

(1) Position blower relay (12) in launching-handling rail (13).

(2) Secure blower relay (12).

(3) Refer to TM 9-1440-250-35 and connect cable assembly of blower relay (12) to terminal board group (fig. 225).

115. Terminal Board Group

There are two terminal board groups (fig. 225) located inside the launching-handling rail. Each terminal board group consists of a bracket and five terminal board assemblies with bus bars.

a. Removal.

(1) Remove cover assembly (fig. 219).

(2) Remove wires of cable assemblies attached to terminal board group (fig. 225), as described in paragraph 38*d*.

Note. Removal of any terminal board assembly requires removal of terminal board group.

(3) Remove terminal board group.

b. Disassembly. Disassemble terminal board group.

c. Assembly. Assemble terminal board group.

d. Installation.

(1) Install terminal board group.

(2) Refer to TM 9-1440-250-35 and make proper wiring connections.

(3) Install cover assembly (fig. 219).

116. Channel, Connector Assembly, Electrical Connector Shell, and Dummy Connector

The channel (fig. 223) is located on the outside of the launching-handling rail near the outrigger (fig. 219) at the rear. The connector assembly (fig. 223) is located inside the rail.

a. Channel.

(1) Remove channel.

(2) Install channel.

b. Connector Assembly.

(1) *Removal.*

(*a*) Remove cover assembly (fig. 219).

(*b*) Loosen packing nut (fig. 223) of the connector assembly and pull cable assembly to the rear through bulkhead and connector assembly.

(*c*) Remove connector assembly.

(2) *Installation.*

(*a*) Position connector assembly in hole in bulkhead.

(*b*) Loosen packing nut and insert wires of missile-away cable assembly.

(*c*) Pull cable assembly through connector assembly and bulkhead.

(*d*) Refer to TM 9-1440-250-35 and make proper wiring connections.

(*e*) Tighten packing nut.

(*f*) Install cover assembly (fig. 219).

c. Electrical Connector Shell and Dummy Connector.

Note. The key letters shown in parentheses in (1) and (2) below refer to figure 223.1.

(1) *Removal.*

(*a*) Remove electrical connector cover (1) from shell (15) and cover (16) from dummy connector (19).

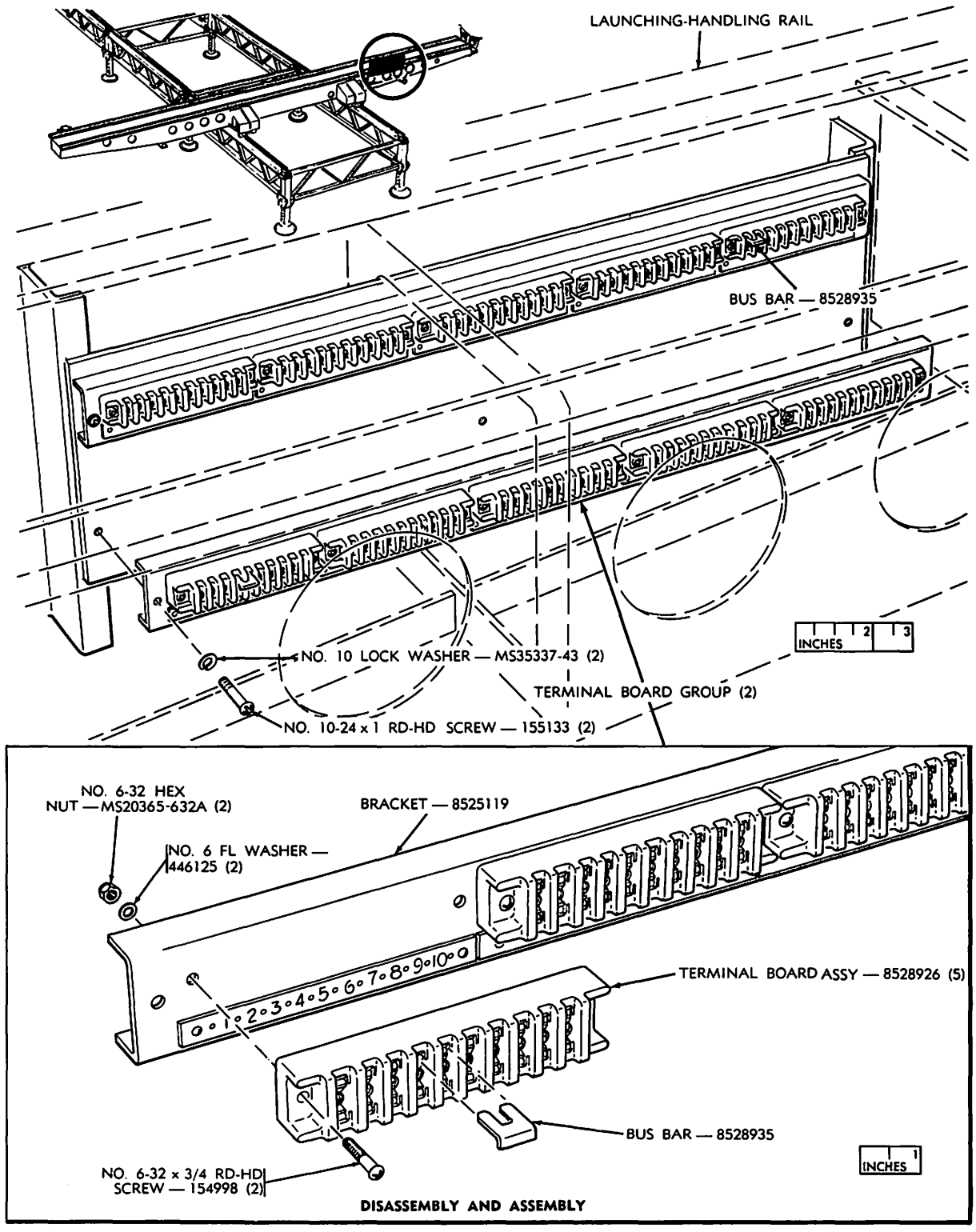

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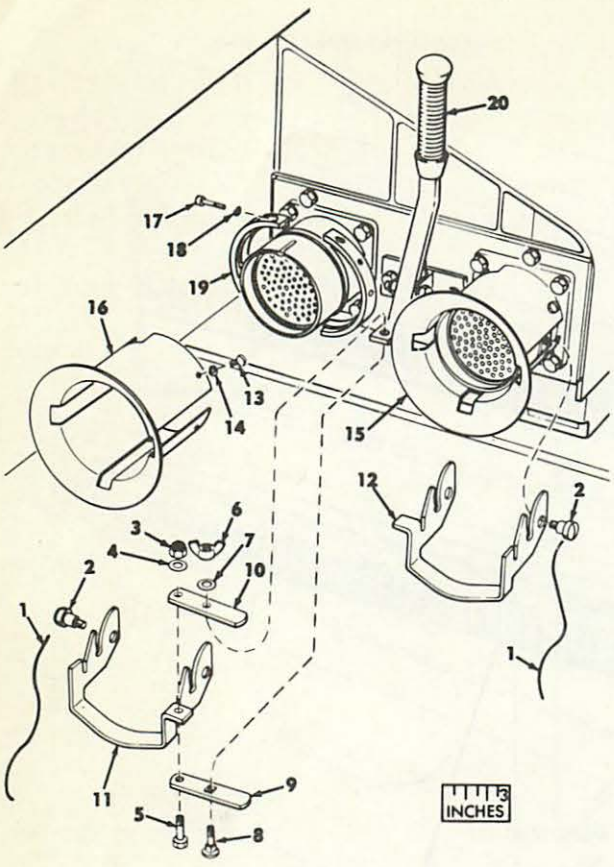
Figure 225. Terminal board group – removal and installation – typical.



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1 — 0.032-inch lockwire
2 — Shoulder screw 03492-R105
3 — No. 10-32 hexagon nut MS20365-1032A
4 — 0.203-inch-id flat washer MS15795-308
5 — No. 10-32 x 2 3/32 hexagon-head bolt 587659
6 — No. 10-24 wing nut 03492-M4233
7 — 0.203-inch-id flat washer MS15795-208
8 — Square neck bolt MS35751-2
9 — Plate 03492-H203
10 — Follower plate 03492-H202
11 — Cam 03492-R202
12 — Cam 03492-R201
13 — No. 10-32 x 3/8 round head screw 132900
14 — No. 10 lockwasher 03492-AN935-10H
15 — Bell assembly 8527036
16 — Bell assembly 8527037
17 — No. 10-32 x 1 socket-head cap screw MS35458-15
18 — No. 10 lockwasher MS35337-43
19 — Clamp 03492-R102
20 — Disconnect lever

Figure 226. Removal and installation of the bell assemblies.

Figure 226. Removal and installation of the bell assemblies — legend.

(*b*) Remove shell (15) and dummy connector (19).

(2) *Installation.*

(*a*) Install shell (15) and dummy connector (19).

(*b*) Install cover (16) and electrical connector cover (1).

117. Bell Assemblies

Note. The key numbers shown in parentheses in *a* and *b* below refer to figure 226 unless otherwise indicated.

Two bell assemblies (15 and 16) are located on the launching-handling rail (fig. 218).

a. Removal.

(1) Disconnect rail power cable assemblies (fig. 224).

(2) Remove shoulder screws (2).

(3) Remove plate (9), follower plate (10), and cams (11 and 12).

(4) Loosen socket-head cap screw (17) and remove bell assemblies.

(5) Remove clamps (19).

b. Installation.

(1) Install clamps (19).

Note. When installing clamps, make certain connections are made to the vertical, that is, with top at twelve o'clock and bottom at six o'clock.

(2) Position bell assemblies (15 and 16) and install and tighten socket-head cap screw (17).

(3) Install cams (11 and 12) with shoulder screws (2).

(4) Install follower plate (10) and plate (9).

(5) Connect rail power cable assemblies (fig. 224).

Section IV. MAINTENANCE OF LAUNCHING-HANDLING BREAKAWAY INSTALLATION

118. General

This section describes maintenance of the components of the launching-handling rail breakaway installation (fig. 218). The breakaway installation consists of a pivot group (fig. 227) and a bracket group (fig. 229). The general precautions described in paragraph 105 must be observed when performing any maintenance on these items.

Figure 228. (Deleted)

119. Pivot Group

Note. The key numbers shown in parentheses in *a* through *d* below refer to figure 227.

a. Removal.
(1) Remove spring (1).
(2) Remove pivot group (5).

b. Disassembly. Disassemble pivot group (5).

c. Assembly. Assemble pivot group (5).

d. Installation.
(1) Install pivot group (5).
(2) Install extension helical spring (1).

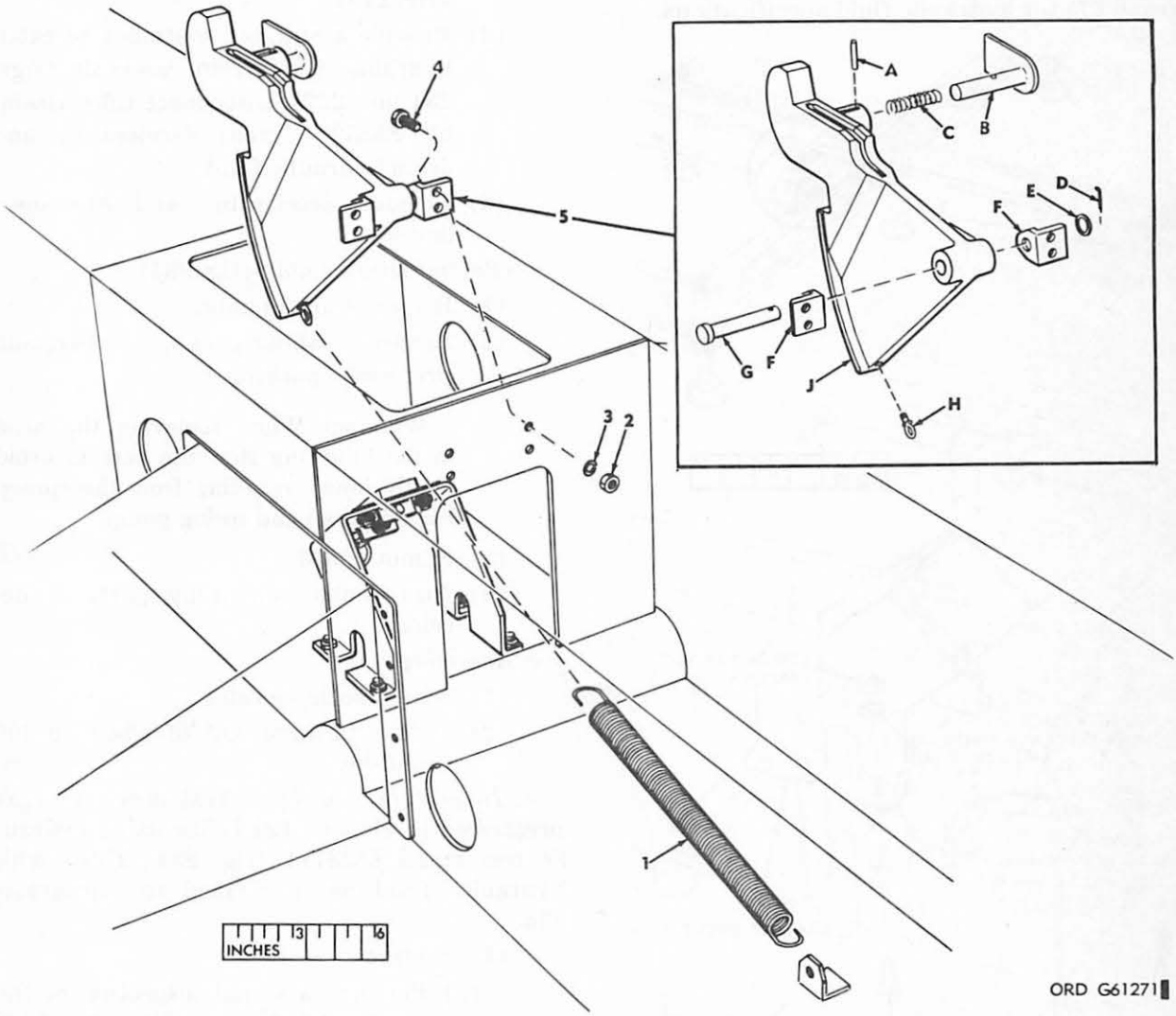
120. Bracket Group

a. Removal (fig. 229). Remove bracket group.

b. Disassembly (fig. 230). Disassemble bracket group.

c. Assembly (fig. 230). Assemble bracket group.

d. Installation (fig. 229). Install bracket group.



1 — Extension helical spring 8525274
2 — ⅜-24 hexagon nut AN315-6R
3 — ⅜-inch lockwasher MS35338-27
4 — ⅜-24 x 6¼ hexagon-head bolt AN6-7A
5 — Pivot group
A — Spring pin NAS561-4-9
B — Headed straight pin 9019300
C — Compression helical spring 9019275
D — 3/32 x 1 cotter pin 583168
E — ¼-inch flat washer 502288
F — Angle bracket 8525317
G — Headed straight pin MS20392-7-95
H — Eyebolt 8526915
J — Pivot 8525316

Figure 227. Removal and installation of the pivot group.

Section V. MAINTENANCE OF DECELERATOR SYSTEM COMPONENTS

121. General

This section describes the maintenance of the front and rear decelerators, (figs. 231 and 232), the hydraulic network, and the cork gasket for the hydraulic reservoir. The general precautions described in paragraphs 58 and 105 must be observed when performing any maintenance on these items. Refer to paragraph 37*a* for hydraulic fluid specifications.

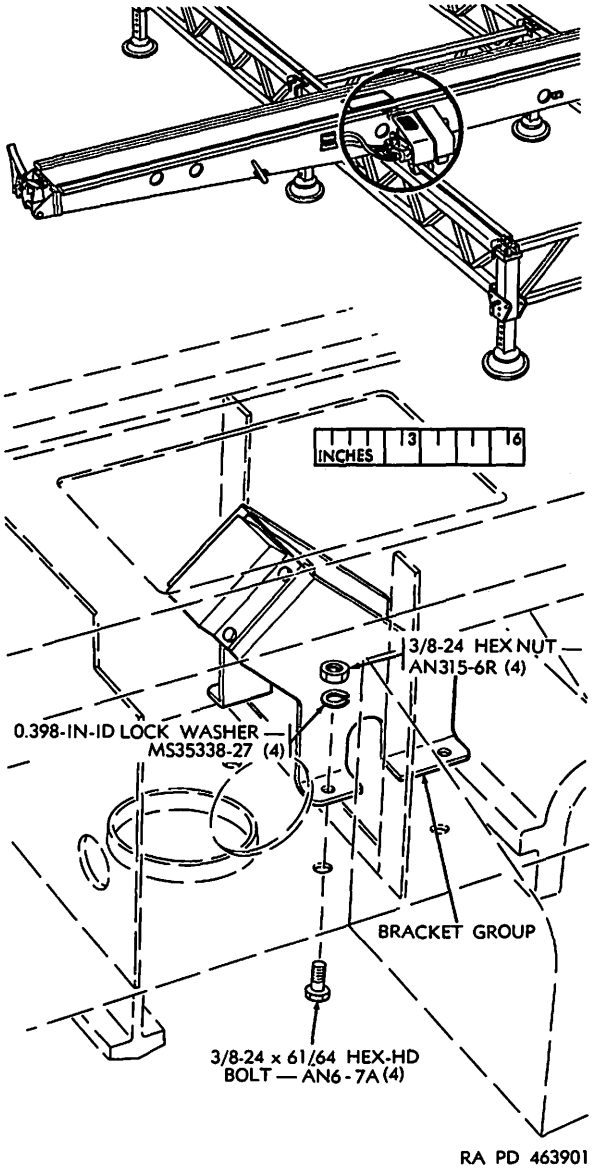


Figure 229. Removal and installation of the bracket group.

122. Decelerator

A decelerator (fig. 218), covered by an individual guard, is located at each of the four outriggers. The procedures in *a* through *c* below are typical for both the front decelerator (fig. 231) and rear decelerator (fig. 232).

a. Removal.

(1) Remove two front guard assemblies (fig. 219).

(2) Provide a suitable container to catch hydraulic fluid from reservoir (figs. 231 and 232), disconnect tube assembly 8525234 from decelerator, and drain hydraulic fluid.

(3) Remove decelerator and cap open line.

b. Partial Disassembly (fig. 233).

(1) Remove pin and plug.

(2) Remove bushing group, retainer, and preformed packing.

Warning: **When removing the head in the following step, use care to avoid bodily injury resulting from the spring-loaded piston and spring group.**

(3) Remove head.

(4) Disassemble remaining parts of decelerator.

c. Assembly.

(1) Assemble decelerator.

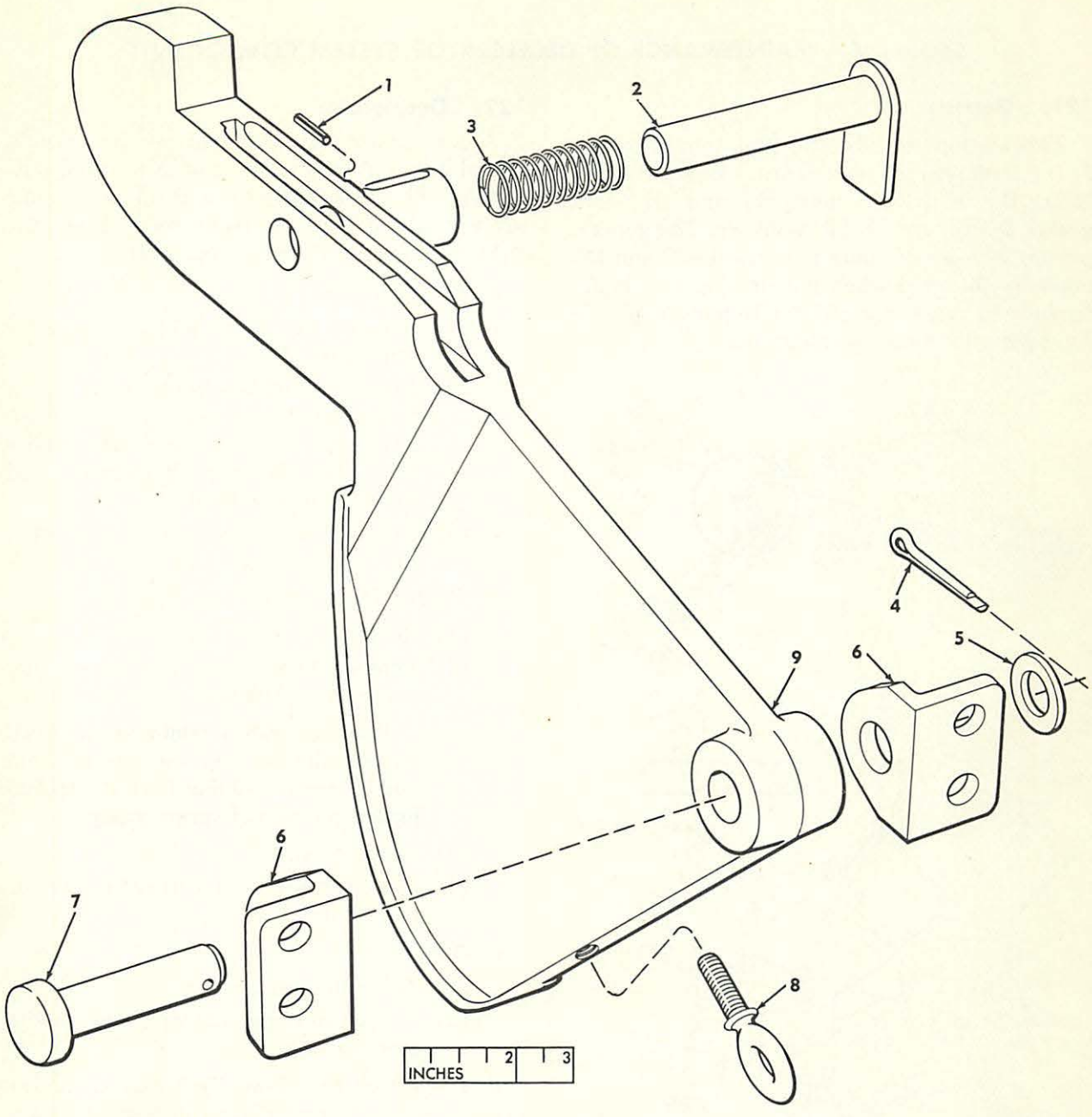
(2) Torque hexagon nut of elbow to 300 pound-inches.

d. Inspection and Test. Test decelerator as prescribed in (1) and (2) below using hydraulic test stand 8523711 (fig. 234) filled with hydraulic fluid as prescribed in paragraph 37*a*.

(1) *Pretest.*

(*a*) Perform a visual inspection of the decelerator for completeness of assembly, and for nicks, scratches, or other damage.

(*b*) Prior to testing decelerator, warm up test stand as prescribed in paragraphs A, B, and C of Instruction Card 2001.



ORD G55662

1—Spring pin—NAS561-4-9
2—Headed straight pin—9019300
3—Helical compression spring—9019275
4—3/32 x 1 cotter pin—583168
5—¼-inch flat washer—502288
6—Bracket—8525317
7—Headed straight pin—MS20392-7-95
8—Eyebolt—8526915
9—Pivot—8525316

Figure 228. Pivot group—disassembly and assembly.

Section V. MAINTENANCE OF DECELERATOR SYSTEM COMPONENTS

121. General

This section describes the maintenance of the front and rear decelerators, (figs. 231 and 232), the hydraulic network, and the cork gasket for the hydraulic reservoir. The general precautions described in paragraphs 58 and 105 must be observed when performing any maintenance on these items. Refer to paragraph 37*a* for hydraulic fluid specifications.

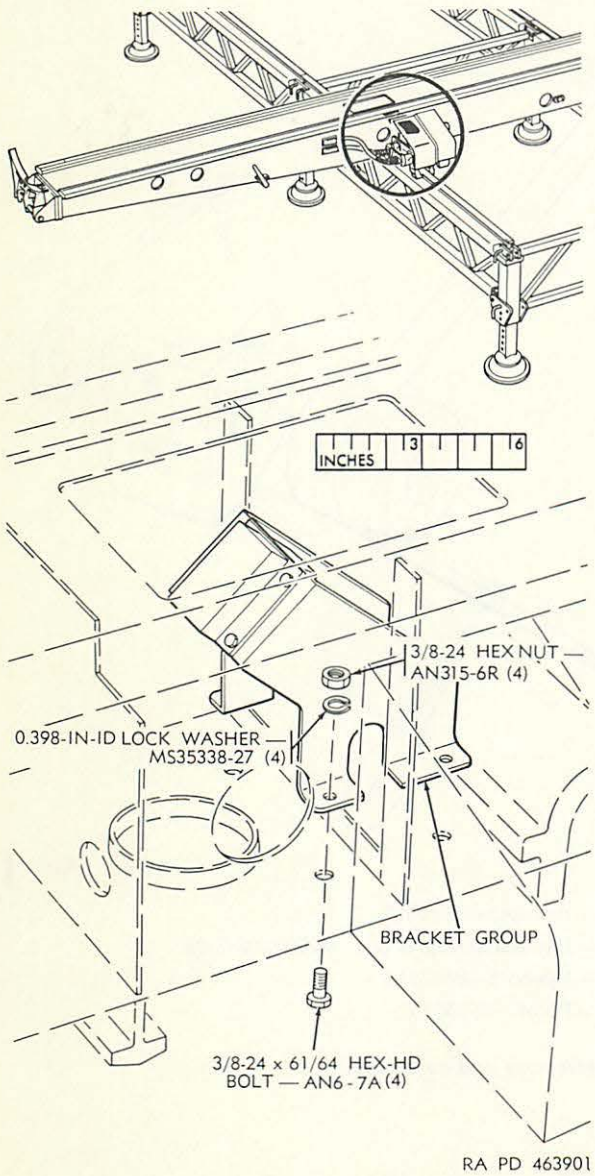


Figure 229. Bracket Group – removal and installation.

122. Decelerator

A decelerator (fig. 218), covered by an individual guard, is located at each of the four outriggers. The procedures in *a* through *c* below are typical for both the front decelerator (fig. 231) and rear decelerator (fig. 232).

a. Removal.

(1) Remove two front guard assemblies (fig. 219).

(2) Provide a suitable container to catch hydraulic fluid from reservoir (figs. 231 and 232), disconnect tube assembly — 8525234 from decelerator, and drain hydraulic fluid.

(3) Remove decelerator and cap open line.

b. Partial Disassembly (fig. 233).

(1) Remove pin and plug.

(2) Remove bushing group, retainer, and preformed packing.

***Warning:* When removing the head in the following step, use care to avoid bodily injury resulting from the spring-loaded piston and spring group.**

(3) Remove head.

(4) Disassemble remaining parts of decelerator.

c. Assembly.

(1) Assemble decelerator.

(2) Torque hexagon nut of elbow to 300 pound-inches.

d. Inspection and Test. Test decelerator as prescribed in (1) and (2) below using hydraulic test stand — 8523711 (fig. 234) filled with hydraulic fluid as prescribed in paragraph 37*a*.

(1) *Pretest.*

(*a*) Perform a visual inspection of the decelerator for completeness of assembly, and for nicks, scratches, or other damage.

(*b*) Prior to testing decelerator, warm up test stand as prescribed in paragraphs A, B, and C of Instruction Card 2001.

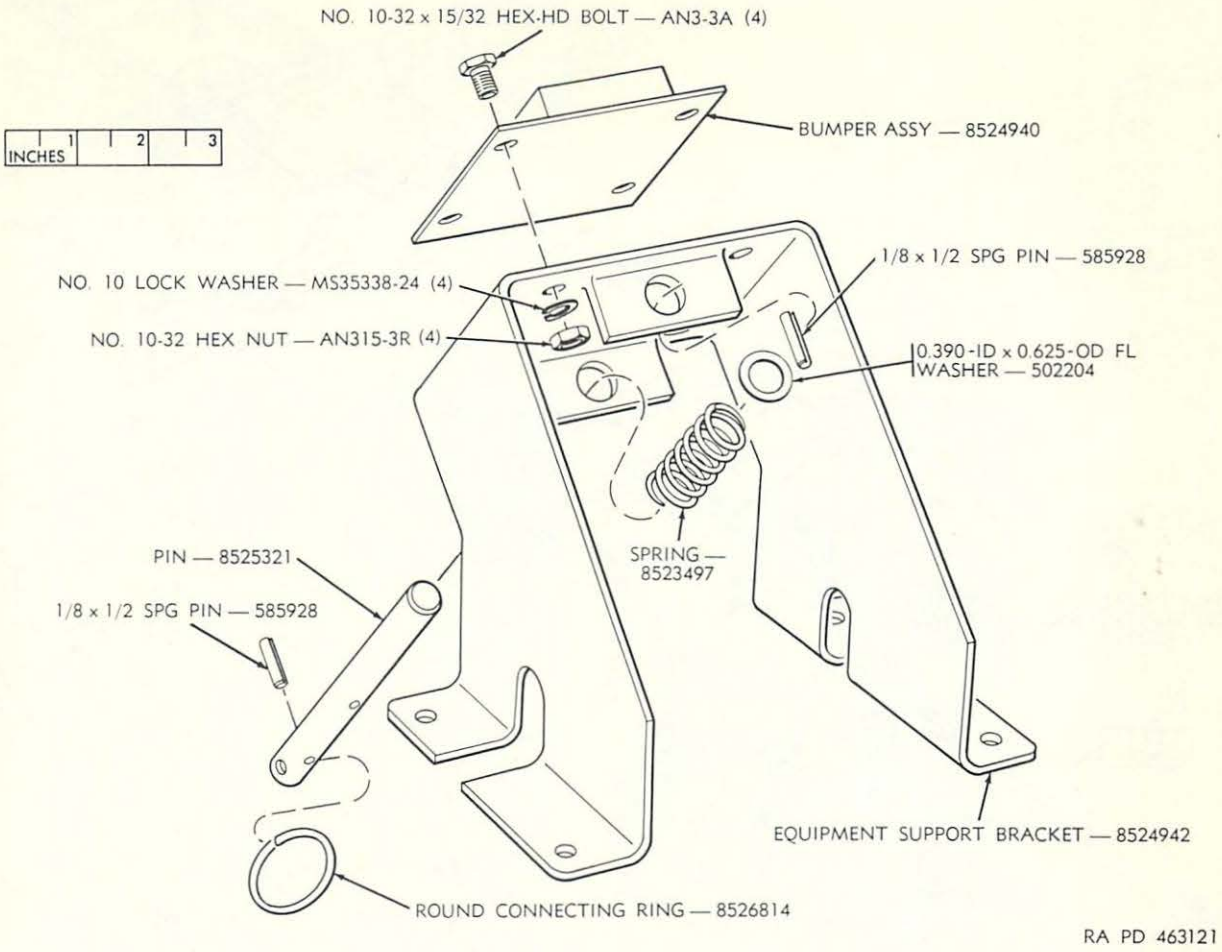


Figure 230. Bracket group – disassembly and assembly.

(2) *Acceptance test* (fig. 234).

(*a*) Connect test hose assembly, test hose assembly reducer, two adapters, two bleed valve hose assemblies, bleed valve, reducer, and quick-disconnect coupling half; torque fittings to 300 pound-inches.

(*b*) Attach coupling half to PRESSURE of the MOTOR PUMP SYSTEM on the panel of the test stand; connect the test hose assembly to the elbow on decelerator and torque coupling nut to 300 pound-inches.

(*c*) Position test stand controls and perform acceptance test as prescribed in table XIII.

(*d*) Disconnect coupling half, reducer, bleed valve hose assembly, adapters, bleed valve, test hose assembly reducer, and test hose assembly; stow in cabinet of test stand.

(*e*) Position the decelerator, elbow down, so that all hydraulic fluid will drain into the sink. Cap elbow to prevent contamination.

e. Installation.

(1) Install decelerator (figs. 231 or 232).

(2) Remove protective cap from elbow of decelerator, connect tube assembly, and torque coupling nut to 150 pound-inches.

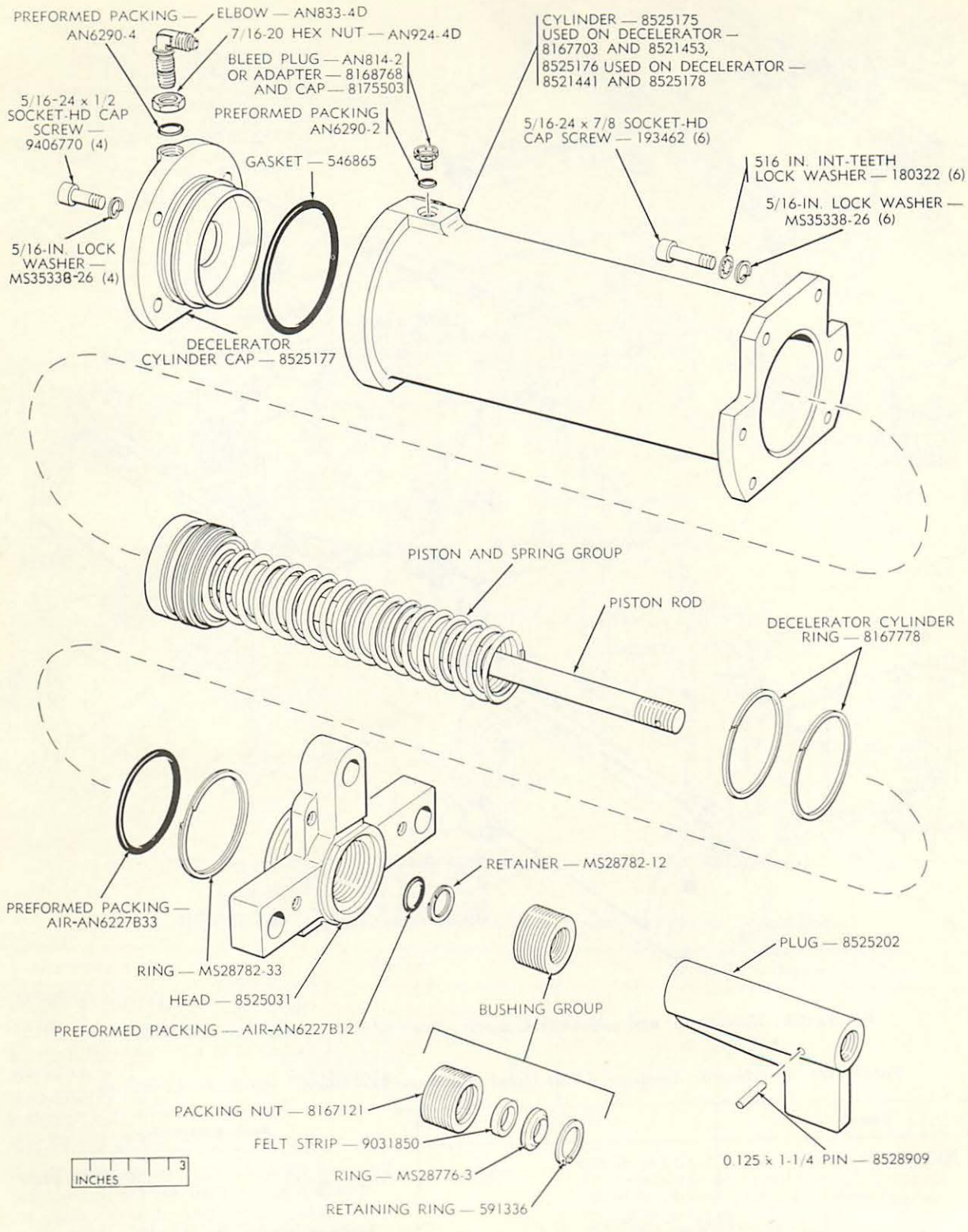


Figure 233. Decelerator – partial disassembly and assembly.

Table XIII. Decelerator Acceptance Test Using Hydraulic Test Stand – 8523711 – Continued.

Control	Position	Reading/Indication
g. RELIEF VALVE ----	Open ----------	
h. PRESSURE TO MANIFOLD – MANIFOLD TO RESERVOIR	MANIFOLD TO RESERVOIR	
i. PUMP MOTOR ------	Depress STOP pushbutton--	
j. GAGE B SHUTOFF--	Close ----------	
k. Open bleed valve – 8169439 and allow fluid in hose to drain into sink.		

(3) Fill hydraulic reservoir with hydraulic fluid as prescribed in paragraph 37*a*.

(4) Perform bleed procedure for decelerator as described in TM 9-1440-250-20.

(5) Install guard assembly (fig. 219).

123. Decelerator Hydraulic Network

Hydraulic networks are provided for both the front and rear decelerators (fig. 231 and 232). These networks consist of the necessary tube assemblies and fittings to provide a gravity source of hydraulic fluid from the hydraulic reservoir to their respective decelerators. The decelerator hydraulic network is indenpendent of the launcher hydraulic systems.

a. Removal.

(1) Remove front or rear guard assembly (fig. 219) from decelerator hydraulic network to be replaced.

(2) Remove cover assembly to provide easier access to front decelerator network.

(3) Provide a suitable container to catch hydraulic fluid from reservoir (figs. 231 and 232), disconnect tube assembly — 8525234, and drain hydraulic fluid.

(4) Remove parts of network requiring replacement and cap all open lines.

b. Installation.

(1) Install adapter, tube tee, and elbow.

(2) Install tube assemblies and torque coupling nuts to the following specified values.

Tube assembly	*Torque value* (pound-inches)
8525234	50
8525277	50
9029931	150
9029934	150

(3) Install cover assembly (fig. 219).

(4) Fill hydraulic reservoir (figs. 231 and 232) with hydraulic fluid, as prescribed in paragraph 37*a*.

(5) Perform bleed procedure for decelerator as described in TM 9-1440-250-20.

(6) Install guard assembly (fig. 219).

124. Cork Gasket

A cork gasket (figs. 231 and 232) is located between the top of each hydraulic reservoir and the inside top of the launching-handling rail. Typical removal and installation procedures are described in *a* and *b* below.

a. Removal.

(1) Remove guard assembly (fig. 219).

(2) Disconnect tube assembly (figs. 231 or 232) from front or rear decelerator and drain hydraulic fluid. Cap all open lines.

(3) Remove tube assembly from hydraulic reservoir.

(4) Remove reservoir and gasket.

b. Installation.

(1) Position gasket over mounting holes of hydraulic reservoir.

(2) Install reservoir.

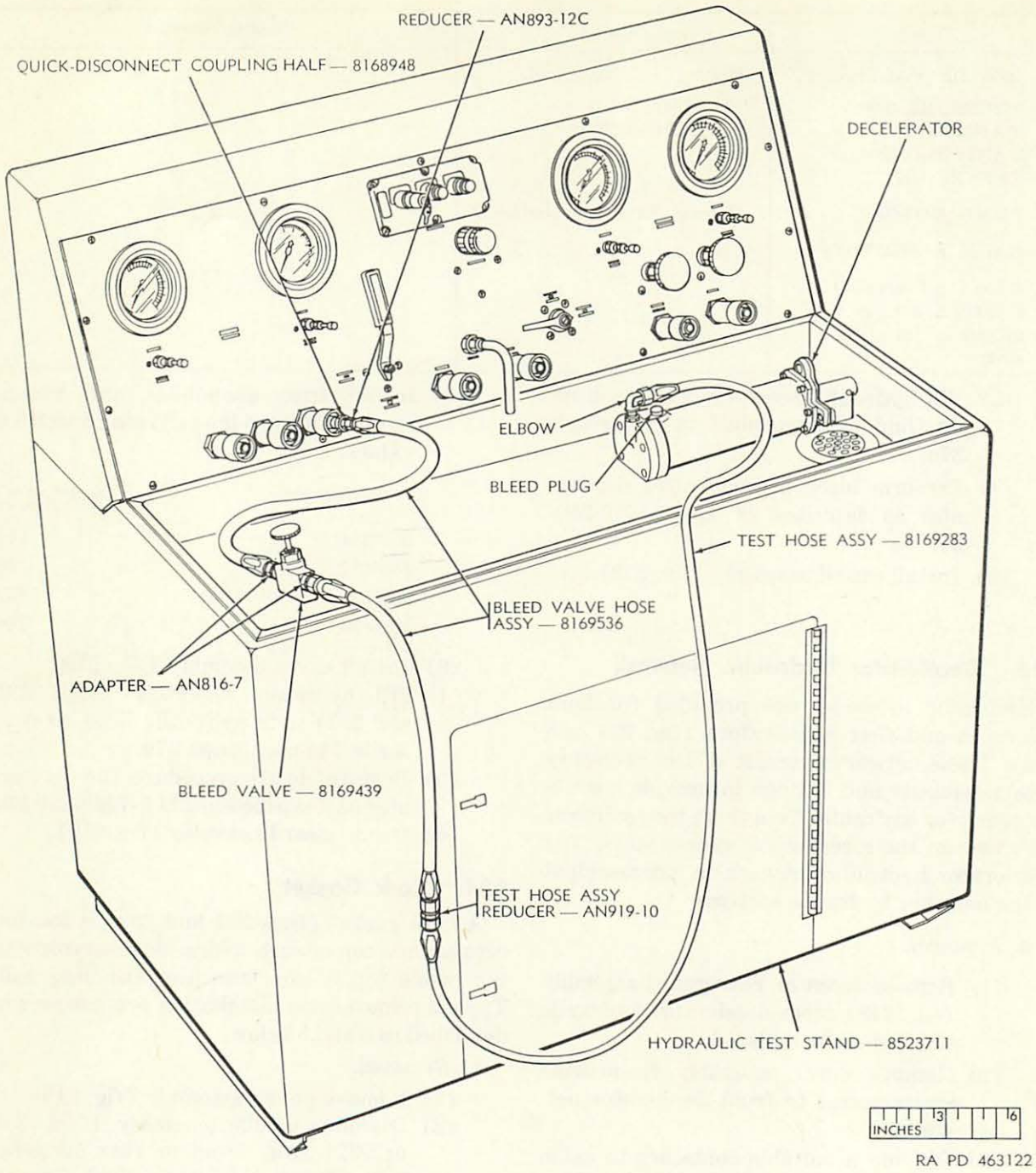


Figure 234. Decelerator – acceptance test.

(3) Install tube assembly between reservoir and tube tee. Torque coupling nut to 50 pound-inches.

(4) Connect tube assembly to decelerator. Torque coupling nut to 50 pound-inches.

(5) Fill reservoir with hydraulic fluid as prescribed in paragraph 37*a*.

(6) Perform bleed procedure for decelerator as described in TM 9-1440-250-20.

(7) Install guard assembly (fig. 219).

Section VI. MAINTENANCE OF LAUNCHING-HANDLING RAIL BRAKE

125. General.

This section describes maintenance of the brake operating mechanism and the brake components. The general precautions described in paragraph 105 must be observed when performing any maintenance on these items.

126. Brake Operating Mechanism

The linkage of the brake operating mechanism (figs. 235, 236, and 237) extends from the positioning handle (fig. 235) to the brake tube assembly (fig. 236) near the front decelerators (fig. 231), and to the stop and positioning tube assembly (fig. 237) near the rear decelerators (fig. 232).

a. Removal.

(1) Remove cover assembly (fig. 219) and plate.

(2) Remove extension spring (fig. 236) and spring (fig. 237).

(3) Remove square-head setscrews and hexagon nuts from stops (fig. 235).

(4) Remove positioning handle connector assembly (fig. 235) and rail arm connector assembly (figs. 235 and 236).

(5) Remove positioning handle (fig. 235) and hand crank.

(6) Remove rigid shaft.

(7) Remove lubrication fittings from pillow block plain bearing units.

(8) Remove two plain bearing units.

(9) Remove connector hand crank and missile launching rail arm.

(10) Remove sleeve bearing.

(11) Remove brake connector assembly (figs. 236 and 237).

(12) Remove lever assembly (fig. 237).

(13) Remove lubrication fitting from bearing.

(14) Remove bearing.

b. Installation.

(1) Install bearing.

(2) Install lubrication fitting on bearing.

(3) Install lever assembly.

(4) Install brake connector assembly (figs. 236 and 237).

(5) Install sleeve bearing (fig. 235).

(6) Install lubrication fitting on sleeve bearing.

(7) Install connector hand crank and missile launching rail arm.

(8) Install two pillow block plain bearing units.

(9) Install lubrication fittings on bearing units.

(10) Install rigid shaft.

(11) Install positioning handle and hand crank.

(12) Install positioning handle connector assembly (fig. 235) and rail arm connector assembly (figs. 235 and 236).

(13) Install ½-13 x ¾ square-head setscrews (fig. 235) on stops.

(14) Install extension spring (fig. 236) and spring (fig. 237).

(15) Install cover assembly (fig. 219) and plate.

c. Adjustment.

(1) Depress hand crank (fig. 235) or positioning handle until brake tube assembly (fig. 236) and stop and positioning tube assembly (fig. 237) are released and movement of the launching-handling rail is possible. Adjust square-head setscrew (fig. 235) at the rear to allow holding the handle at RELEASE, and tighten the hexagon nut of the square-head setscrew.

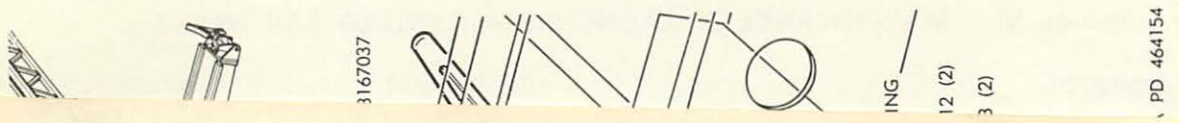
(2) Raise crank until brake tube assembly and positioning tube assembly are locked on stops; adjust setscrew at the front while holding crank in place, and tighten the nut of the setscrew.

underneath the launching-handling rail at the front.

a. Removal.

(fig. 219).

(3) Remove both front decelerators (fig. 231) as described in paragraph 122*a*.



Section VII. MAINTENANCE OF THE LAUNCHING-HANDLING RAIL STOP AND POSITIONING TUBE ASSEMBLY

128. General

This section describes maintenance of the stop and positioning tube assembly (fig. 237). The general precautions described in paragraph 105 must be observed when performing any maintenance on this item.

129. Stop and Positioning Tube Assembly

The stop and positioning tube assembly is located underneath the launching-handling rail.

a. Removal.

(1) Position the launching-handling rail against the loading rack stops (fig. 56).

(2) Remove the two rear guard assemblies (fig. 219).

(3) Remove both rear decelerators (fig. 232) as described in paragraph 122*a*.

(4) Disconnect the rod end connector assembly (fig. 237) from the stop and positioning tube assembly.

(5) Remove the stop and positioning tube assembly.

b. Disassembly. Disassemble the stop and positioning tube assembly (fig. 239).

c. Assembly. Assemble the stop and positioning tube assembly.

d. Installation.

(1) Position the stop and positioning tube assembly (fig. 237) on the launching-handling rail and attach the rod end connector assembly.

(2) Install the rear decelerators (fig. 232) as described in paragraph 122*e*.

(3) Install the two rear guard assemblies (fig. 219).

Section VIII. MAINTENANCE OF THE LAUNCHING-HANDLING RAIL HOOK ASSEMBLIES

130. General

This section describes maintenance of the hook assemblies (fig. 218). The general precautions described in paragraph 105 must be observed when performing any maintenance on these items.

131. Hook Assemblies

Two hook assemblies (fig. 240) are located beneath and on each side of the four outriggers of the launching-handling rail. Typical removal, disassembly, assembly, and installation procedures are described in *a* through *d* below.

a. Removal.

Note. The four decelerators (fig. 218) offer interference to the removal of four of the eight hook assemblies. Perform steps (1) and (2) below if removal of one of these hook assemblies is required.

(1) Remove the front or rear guard assembly (fig. 219) as required.

(2) Remove the front or rear decelerator as described in paragraph 122*a*.

Note. The key numbers shown in parentheses in steps (3) through (7) below refer to figure 240.

(3) Remove the bumper (2).

(4) Remove the launching-handling rail as described in paragraph 36*c*(1).

(5) Remove the two pins (3) with retaining rings (4).

Note. The two foremost hook assemblies, where applicable, require a shim (7) to insure correct actuation of the elevator warning device. The other six hook assemblies contain a setscrew (5).

(6) Remove the shim or the setscrew.

(7) Remove the hook assembly (8).

b. Disassembly. Disassemble the hook assembly (fig. 240).

c. Assembly. Assemble the hook assembly (fig. 240).

d. Installation.

Note. The key numbers shown in parentheses in steps (1) through (3) below refer to figure 240.

(1) Attach the shim (7) or install the setscrew (5).

(2) Position the hook assembly (8) on the launching-handling rail and install the two pins (3) with retaining rings (4).

(3) Install the bumper (2).

(4) Install the launching-handling rail as described in paragraph 36*c*(2).

(5) Install the decelerator as described in paragraph 122*e*.

(6) Install the guard assembly (fig. 219).

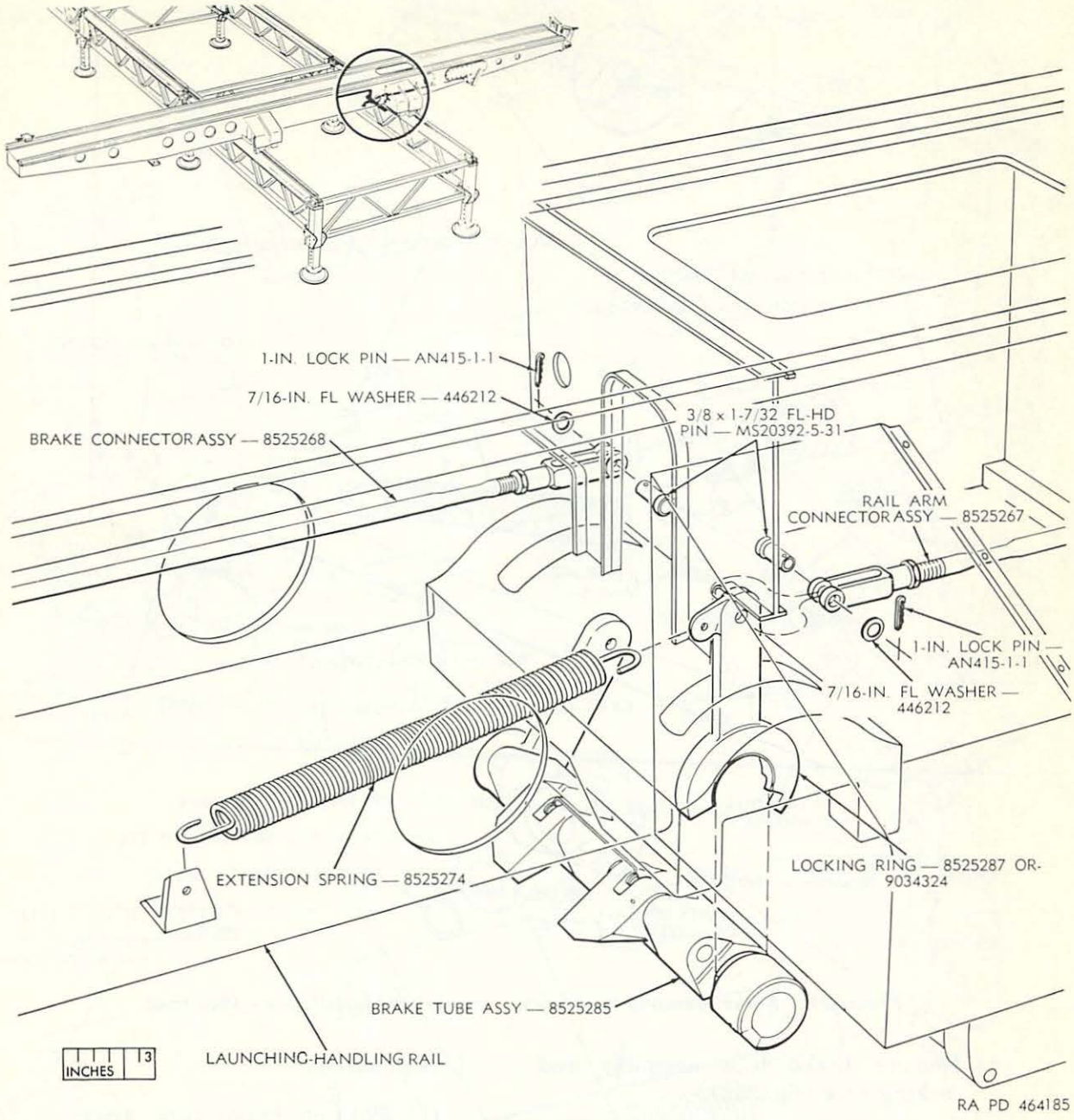


Figure 236. Brake operating mechanism – removal and installation – Continued.

127. Brake Tube Assembly

The brake tube assembly (fig. 236) is located underneath the launching-handling rail at the front.

a. Removal.

(1) Position launching-handling rail against loading rack stops (fig. 56).

(2) Remove two front guard assemblies (fig. 219).

(3) Remove both front decelerators (fig. 231) as described in paragraph 122*a*.

Section VII. MAINTENANCE OF THE LAUNCHING-HANDLING RAIL STOP AND POSITIONING TUBE ASSEMBLY

128. General

This section describes maintenance of the stop and positioning tube assembly (fig. 237). The general precautions described in paragraph 105 must be observed when performing any maintenance on this item.

129. Stop and Positioning Tube Assembly

The stop and positioning tube assembly is located underneath the launching-handling rail.

a. Removal.

(1) Position the launching-handling rail against the loading rack stops (fig. 56).

(2) Remove the two rear guard assemblies (fig. 219).

(3) Remove both rear decelerators (fig. 232) as described in paragraph 122*a*.

(4) Disconnect the rod end connector assembly (fig. 237) from the stop and positioning tube assembly.

(5) Remove the stop and positioning tube assembly.

b. Disassembly. Disassemble the stop and positioning tube assembly (fig. 239).

c. Assembly. Assemble the stop and positioning tube assembly.

d. Installation.

(1) Position the stop and positioning tube assembly (fig. 237) on the launching-handling rail and attach the rod end connector assembly.

(2) Install the rear decelerators (fig. 232) as described in paragraph 122*e*.

(3) Install the two rear guard assemblies (fig. 219).

Section VIII. MAINTENANCE OF THE LAUNCHING-HANDLING RAIL HOOK ASSEMBLIES

130. General

This section describes maintenance of the hook assemblies (fig. 218). The general precautions described in paragraph 105 must be observed when performing any maintenance on these items.

131. Hook Assemblies

Two hook assemblies (fig. 240) are located beneath and on each side of the four outriggers of the launching-handling rail. Typical removal, disassembly, assembly, and installation procedures are described in *a* through *d* below.

a. Removal.

Note. The four decelerators (fig. 218) offer interference to the removal of four of the eight hook assemblies. Perform steps (1) and (2) below if removal of one of these hook assemblies is required.

(1) Remove the front or rear guard assembly (fig. 219) as required.

(2) Remove the front or rear decelerator as described in paragraph 122*a*.

Note. The key numbers shown in parentheses in steps (3) through (7) below refer to figure 240.

(3) Remove the bumper (2).

(4) Remove the launching-handling rail as described in paragraph 36*c*(1).

(5) Remove the two pins (3) with retaining rings (4).

Note. The two foremost hook assemblies, where applicable, require a shim (7) to insure correct actuation of the elevator warning device. The other six hook assemblies contain a setscrew (5).

(6) Remove the shim or the setscrew.

(7) Remove the hook assembly (8).

b. Disassembly. Disassemble the hook assembly (fig. 240).

c. Assembly. Assemble the hook assembly (fig. 240).

d. Installation.

Note. The key numbers shown in parentheses in steps (1) through (3) below refer to figure 240.

(1) Attach the shim (7) or install the setscrew (5).

(2) Position the hook assembly (8) on the launching-handling rail and install the two pins (3) with retaining rings (4).

(3) Install the bumper (2).

(4) Install the launching-handling rail as described in paragraph 36*c*(2).

(5) Install the decelerator as described in paragraph 122*e*.

(6) Install the guard assembly (fig. 219).

Table XIII. Decelerator Acceptance Test Using Hydraulic Test Stand – 8523711 – Continued.

Control	Position	Reading/Indication
g. RELIEF VALVE ----	Open ----------	
h. PRESSURE TO MANIFOLD – MANIFOLD TO RESERVOIR	MANIFOLD TO RESERVOIR	
i. PUMP MOTOR ------	Depress STOP pushbutton--	
j. GAGE B SHUTOFF--	Close ----------	
k. Open bleed valve – 8169439 and allow fluid in hose to drain into sink.		

(3) Fill hydraulic reservoir with hydraulic fluid as prescribed in paragraph 37*a*.

(4) Perform bleed procedure for decelerator as described in TM 9-1440-250-20.

(5) Install guard assembly (fig. 219).

123. Decelerator Hydraulic Network

Hydraulic networks are provided for both the front and rear decelerators (fig. 231 and 232). These networks consist of the necessary tube assemblies and fittings to provide a gravity source of hydraulic fluid from the hydraulic reservoir to their respective decelerators. The decelerator hydraulic network is indenpendent of the launcher hydraulic systems.

a. Removal.

(1) Remove front or rear guard assembly (fig. 219) from decelerator hydraulic network to be replaced.

(2) Remove cover assembly to provide easier access to front decelerator network.

(3) Provide a suitable container to catch hydraulic fluid from reservoir (figs. 231 and 232), disconnect tube assembly — 8525234, and drain hydraulic fluid.

(4) Remove parts of network requiring replacement and cap all open lines.

b. Installation.

(1) Install adapter, tube tee, and elbow.

(2) Install tube assemblies and torque coupling nuts to the following specified values.

Tube assembly	*Torque value* (pound-inches)
8525234	50
8525277	50
9029931	150
9029934	150

(3) Install cover assembly (fig. 219).

(4) Fill hydraulic reservoir (figs. 231 and 232) with hydraulic fluid, as prescribed in paragraph 37*a*.

(5) Perform bleed procedure for decelerator as described in TM 9-1440-250-20.

(6) Install guard assembly (fig. 219).

124. Cork Gasket

A cork gasket (figs. 231 and 232) is located between the top of each hydraulic reservoir and the inside top of the launching-handling rail. Typical removal and installation procedures are described in *a* and *b* below.

a. Removal.

(1) Remove guard assembly (fig. 219).

(2) Disconnect tube assembly (figs. 231 or 232) from front or rear decelerator and drain hydraulic fluid. Cap all open lines.

(3) Remove tube assembly from hydraulic reservoir.

(4) Remove reservoir and gasket.

b. Installation.

(1) Position gasket over mounting holes of hydraulic reservoir.

(2) Install reservoir.

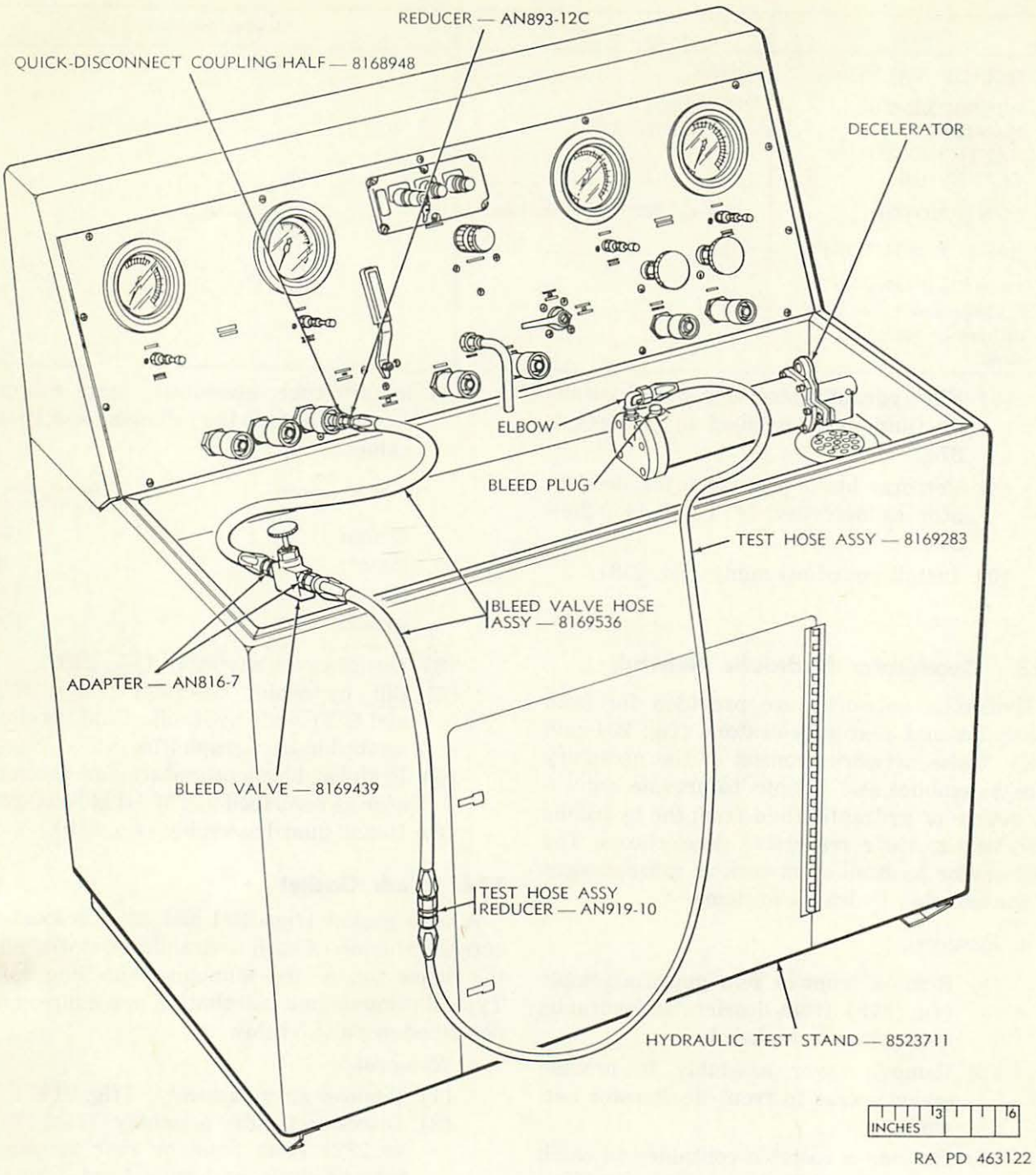


Figure 234. Decelerator – acceptance test.

(3) Install tube assembly between reservoir and tube tee. Torque coupling nut to 50 pound-inches.

(4) Connect tube assembly to decelerator. Torque coupling nut to 50 pound-inches.

(5) Fill reservoir with hydraulic fluid as prescribed in paragraph 37*a*.

(6) Perform bleed procedure for decelerator as described in TM 9-1440-250-20.

(7) Install guard assembly (fig. 219).

Section VI. MAINTENANCE OF LAUNCHING-HANDLING RAIL BRAKE

125. General.

This section describes maintenance of the brake operating mechanism and the brake components. The general precautions described in paragraph 105 must be observed when performing any maintenance on these items.

126. Brake Operating Mechanism

The linkage of the brake operating mechanism (figs. 235, 236, and 237) extends from the positioning handle (fig. 235) to the brake tube assembly (fig. 236) near the front decelerators (fig. 231), and to the stop and positioning tube assembly (fig. 237) near the rear decelerators (fig. 232).

a. Removal.

(1) Remove cover assembly (fig. 219) and plate.

(2) Remove extension spring (fig. 236) and spring (fig. 237).

(3) Remove square-head setscrews and hexagon nuts from stops (fig. 235).

(4) Remove positioning handle connector assembly (fig. 235) and rail arm connector assembly (figs. 235 and 236).

(5) Remove positioning handle (fig. 235) and hand crank.

(6) Remove rigid shaft.

(7) Remove lubrication fittings from pillow block plain bearing units.

(8) Remove two plain bearing units.

(9) Remove connector hand crank and missile launching rail arm.

(10) Remove sleeve bearing.

(11) Remove brake connector assembly (figs. 236 and 237).

(12) Remove lever assembly (fig. 237).

(13) Remove lubrication fitting from bearing.

(14) Remove bearing.

b. Installation.

(1) Install bearing.

(2) Install lubrication fitting on bearing.

(3) Install lever assembly.

(4) Install brake connector assembly (figs. 236 and 237).

(5) Install sleeve bearing (fig. 235).

(6) Install lubrication fitting on sleeve bearing.

(7) Install connector hand crank and missile launching rail arm.

(8) Install two pillow block plain bearing units.

(9) Install lubrication fittings on bearing units.

(10) Install rigid shaft.

(11) Install positioning handle and hand crank.

(12) Install positioning handle connector assembly (fig. 235) and rail arm connector assembly (figs. 235 and 236).

(13) Install ½-13 x ¾ square-head setscrews (fig. 235) on stops.

(14) Install extension spring (fig. 236) and spring (fig. 237).

(15) Install cover assembly (fig. 219) and plate.

c. Adjustment.

(1) Depress hand crank (fig. 235) or positioning handle until brake tube assembly (fig. 236) and stop and positioning tube assembly (fig. 237) are released and movement of the launching-handling rail is possible. Adjust square-head setscrew (fig. 235) at the rear to allow holding the handle at RELEASE, and tighten the hexagon nut of the square-head setscrew.

(2) Raise crank until brake tube assembly and positioning tube assembly are locked on stops; adjust setscrew at the front while holding crank in place, and tighten the nut of the setscrew.

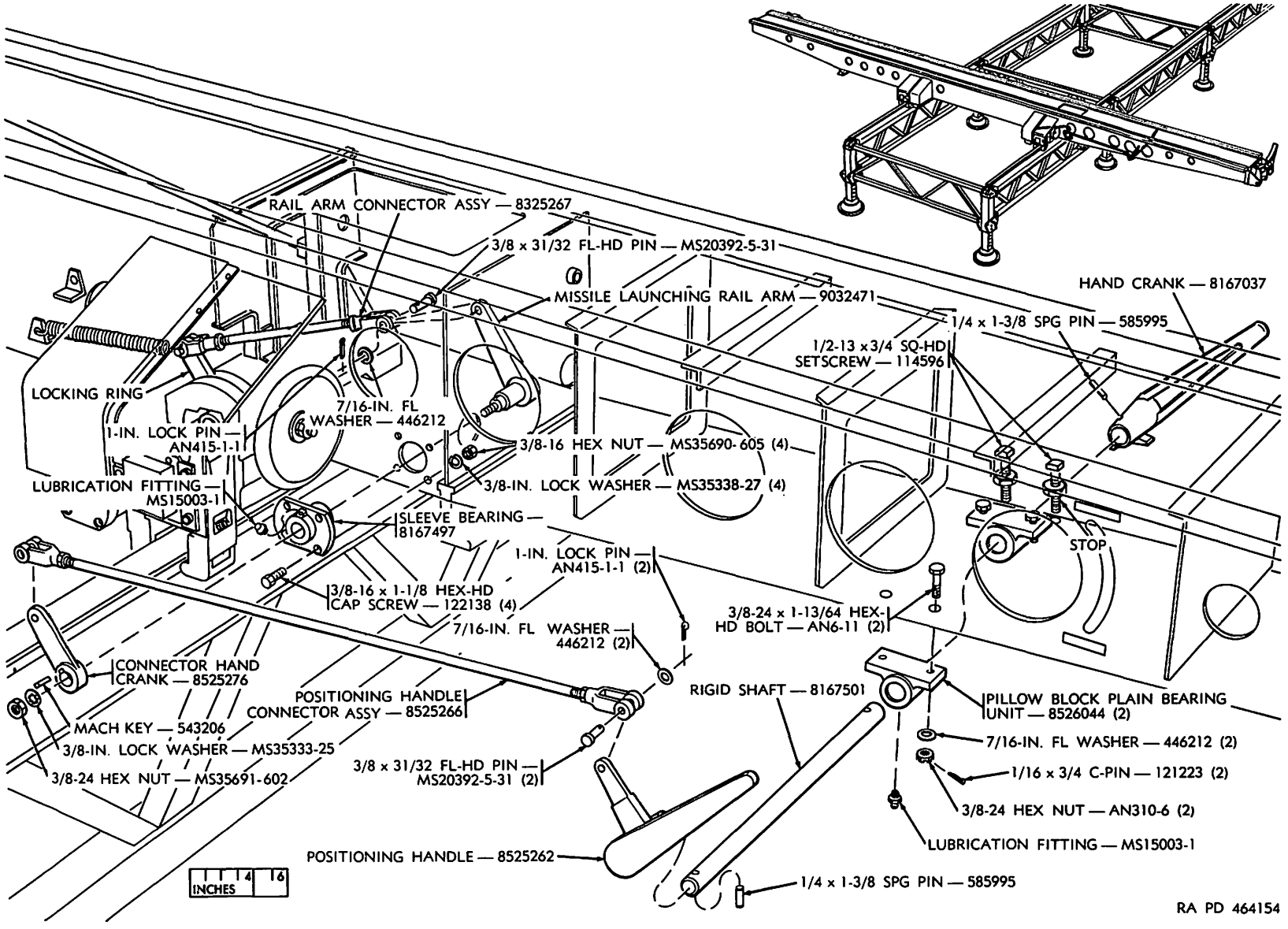


Figure 235. Brake operating mechanism – removal and installation.

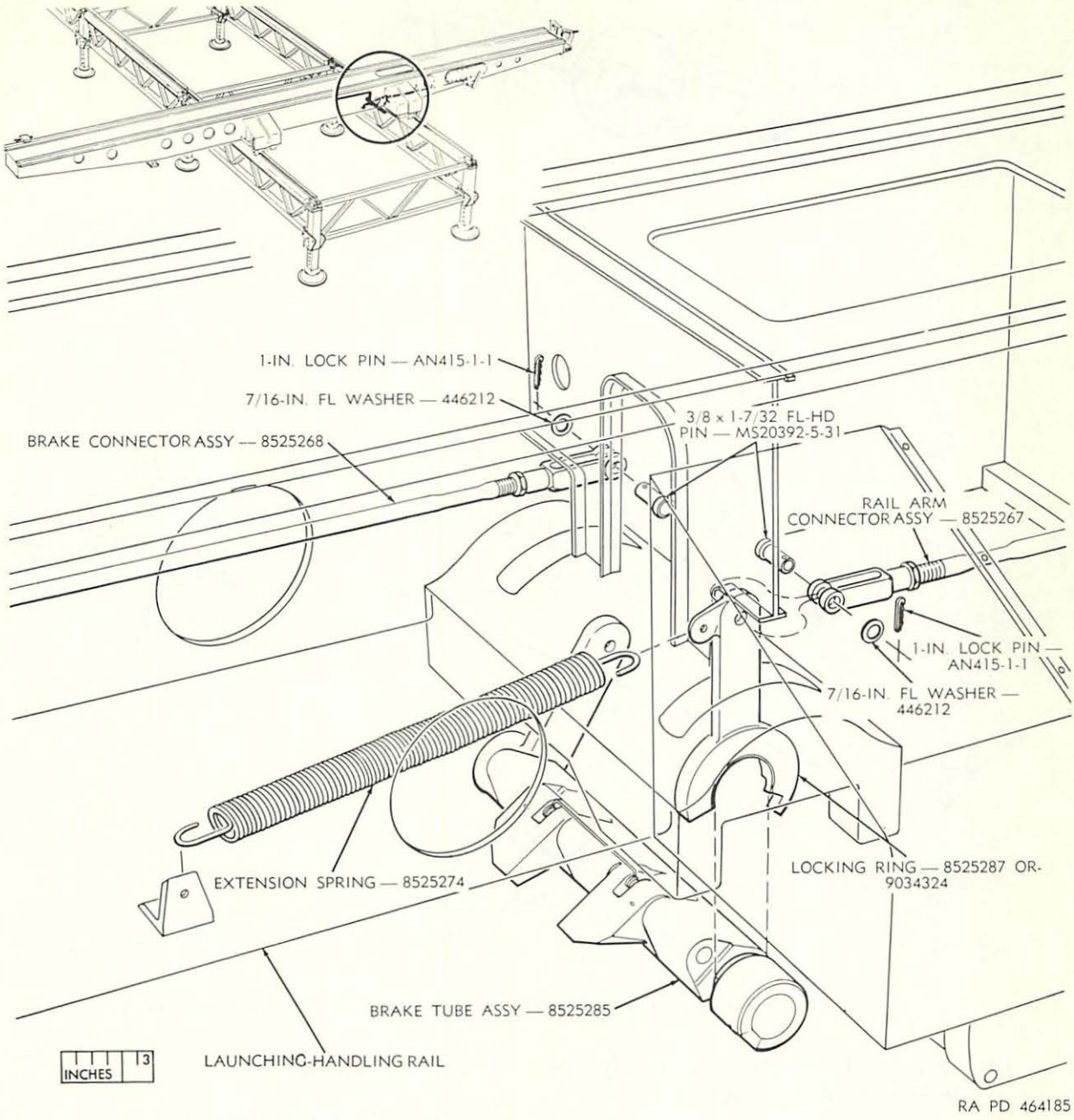


Figure 236. Brake operating mechanism – removal and installation – Continued.

127. Brake Tube Assembly

The brake tube assembly (fig. 236) is located underneath the launching-handling rail at the front.

a. Removal.

(1) Position launching-handling rail against loading rack stops (fig. 56).

(2) Remove two front guard assemblies (fig. 219).

(3) Remove both front decelerators (fig. 231) as described in paragraph 122*a*.

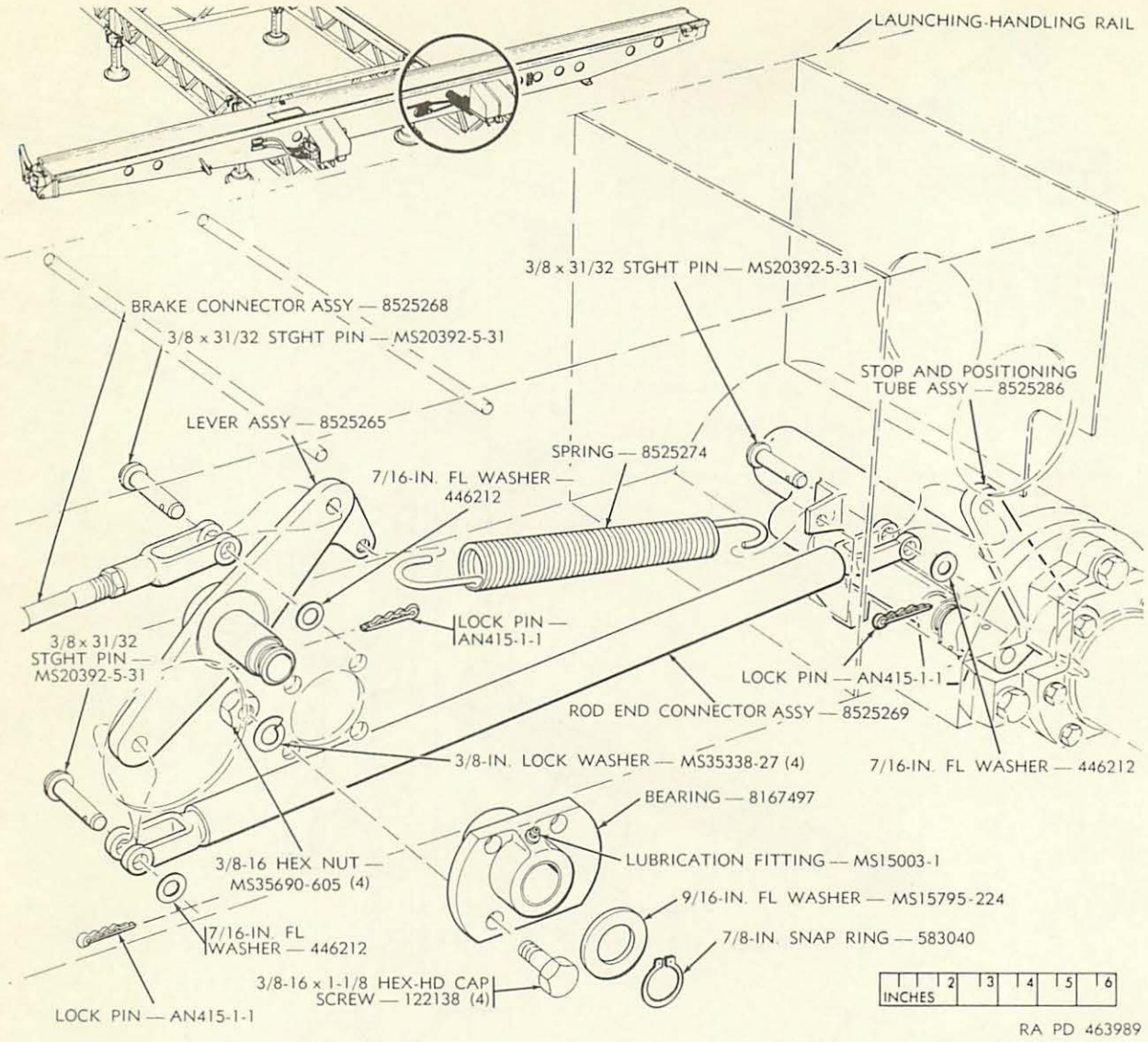


Figure 237. Brake operating mechanism – removal and installation – Continued.

(4) Remove brake tube assembly and locking ring (fig. 236).

b. Disassembly (fig. 238). Disassemble brake tube assembly.

c. Assembly.

(1) Assemble brake tube assembly.

Note. Spring – 8530890 must be installed with control cam – 8530897 and spring – 8530904 with control cam – 8530898.

(2) Check cams for freedom from binding.

d. Installation.

(1) Position brake tube assembly (fig. 236) in launching-handling rail and attach locking ring.

(2) Install locking ring.

(3) Install front decelerators (fig. 231) as described in paragraph 122*e*.

(4) Install two front guard assemblies (fig. 219).

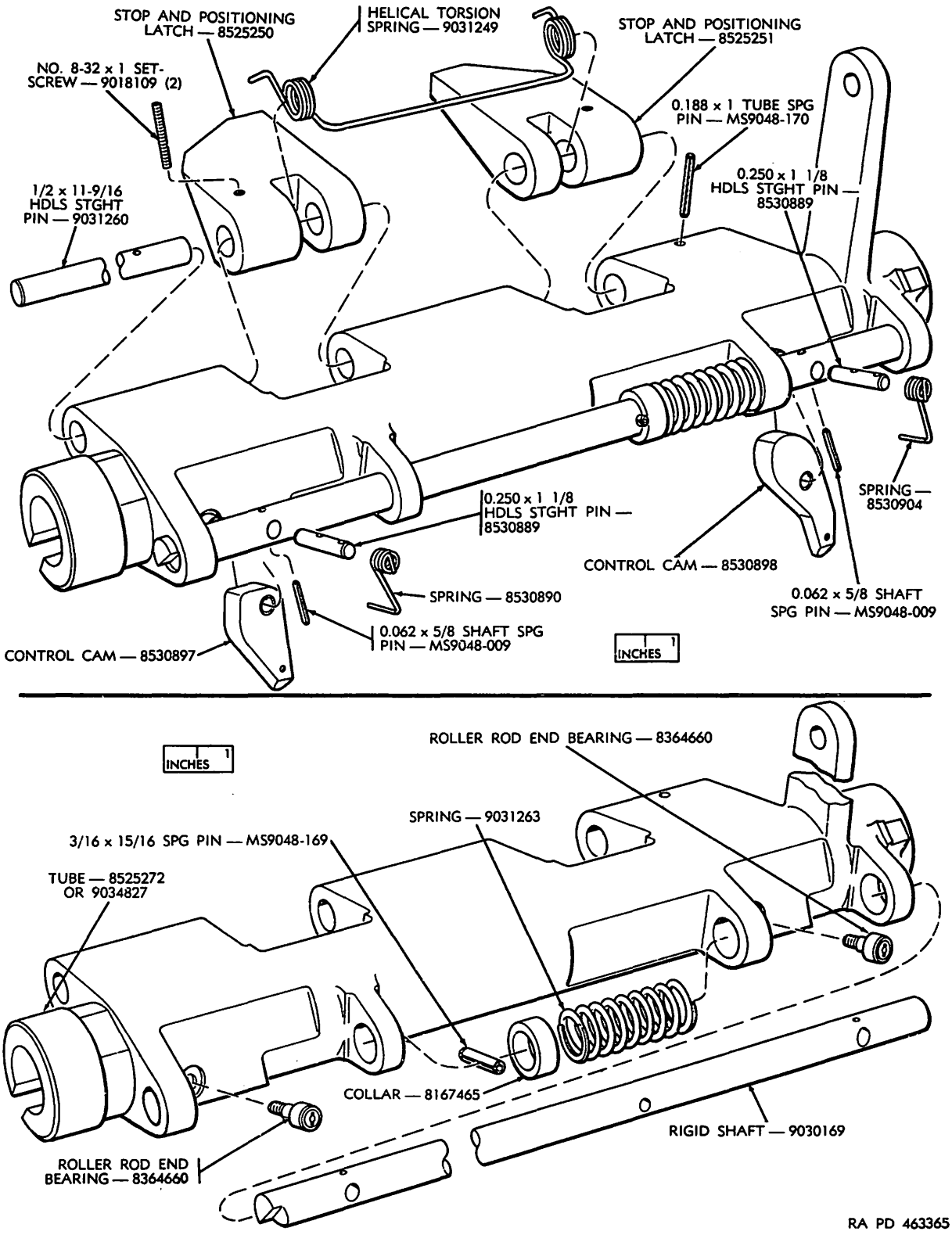


Figure 238. Brake tube assembly – disassembly and assembly.

Section VII. MAINTENANCE OF THE LAUNCHING–HANDLING RAIL STOP AND POSITIONING TUBE ASSEMBLY

128. General

This section describes maintenance of the stop and positioning tube assembly (fig. 237). The general precautions described in paragraph 105 must be observed when performing any maintenance on this item.

129. Stop and Positioning Tube Assembly

The stop and positioning tube assembly is located underneath the launching-handling rail.

a. Removal.

(1) Position the launching-handling rail against the loading rack stops (fig. 56).
(2) Remove the two rear guard assemblies (fig. 219).
(3) Remove both rear decelerators (fig. 232) as described in paragraph 122*a*.
(4) Disconnect the rod end connector assembly (fig. 237) from the stop and positioning tube assembly.
(5) Remove the stop and positioning tube assembly.

b. Disassembly. Disassemble the stop and positioning tube assembly (fig. 239).

c. Assembly. Assemble the stop and positioning tube assembly.

d. Installation.

(1) Position the stop and positioning tube assembly (fig. 237) on the launching-handling rail and attach the rod end connector assembly.
(2) Install the rear decelerators (fig. 232) as described in paragraph 122*e*.
(3) Install the two rear guard assemblies (fig. 219).

Section VIII. MAINTENANCE OF THE LAUNCHING–HANDLING RAIL HOOK ASSEMBLIES

130. General

This section describes maintenance of the hook assemblies (fig. 218). The general precautions described in paragraph 105 must be observed when performing any maintenance on these items.

131. Hook Assemblies

Two hook assemblies (fig. 240) are located beneath and on each side of the four outriggers of the launching-handling rail. Typical removal, disassembly, assembly, and installation procedures are described in *a* through *d* below.

a. Removal.

Note. The four decelerators (fig. 218) offer interference to the removal of four of the eight hook assemblies. Perform steps (1) and (2) below if removal of one of these hook assemblies is required.

(1) Remove the front or rear guard assembly (fig. 219) as required.
(2) Remove the front or rear decelerator as described in paragraph 122*a*.

Note. The key numbers shown in parentheses in steps (3) through (7) below refer to figure 240.

(3) Remove the bumper (2).
(4) Remove the launching-handling rail as described in paragraph 36*c*(1).
(5) Remove the two pins (3) with retaining rings (4).

Note. The two foremost hook assemblies, where applicable, require a shim (7) to insure correct actuation of the elevator warning device. The other six hook assemblies contain a setscrew (5).

(6) Remove the shim or the setscrew.
(7) Remove the hook assembly (8).

b. Disassembly. Disassemble the hook assembly (fig. 240).

c. Assembly. Assemble the hook assembly (fig. 240).

d. Installation.

Note. The key numbers shown in parentheses in steps (1) through (3) below refer to figure 240.

(1) Attach the shim (7) or install the setscrew (5).
(2) Position the hook assembly (8) on the launching-handling rail and install the two pins (3) with retaining rings (4).
(3) Install the bumper (2).
(4) Install the launching-handling rail as described in paragraph 36*c*(2).
(5) Install the decelerator as described in paragraph 122*e*.
(6) Install the guard assembly (fig. 219).

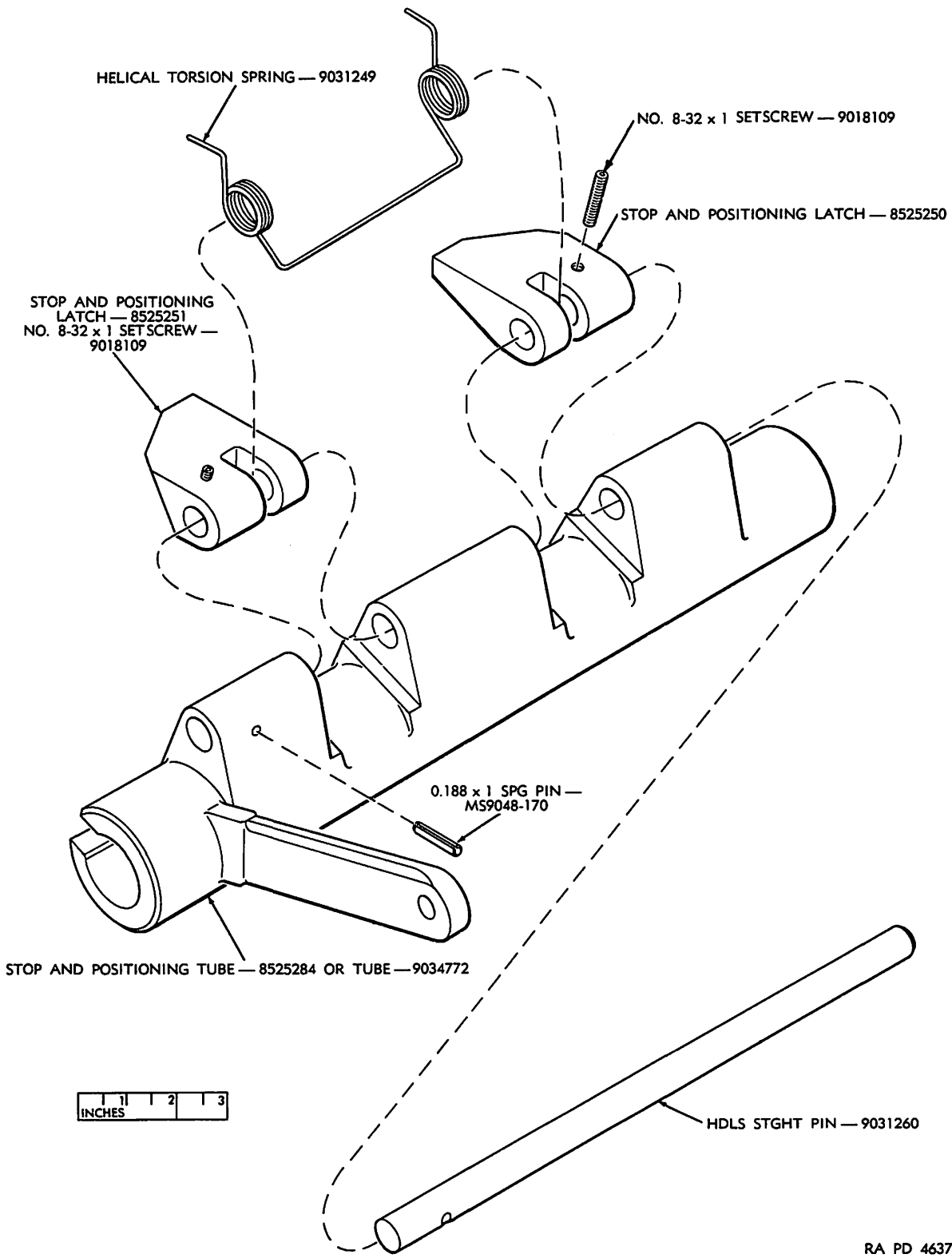
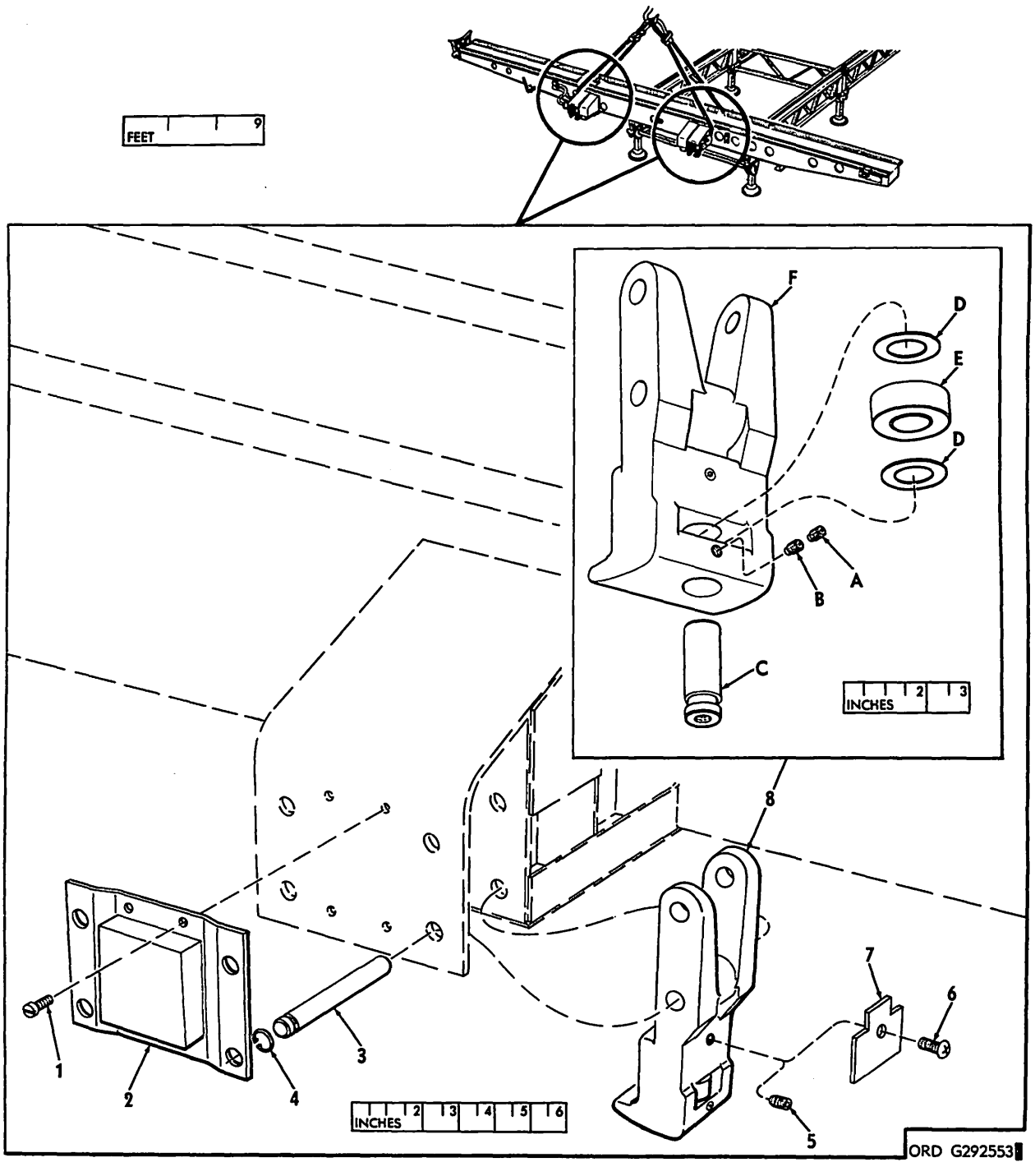


Figure 239. Stop and positioning tube assembly – disassembly and assembly.



1—No. 10-24 x 7/16 fl-hd screw MS35192-54 (4)
2—Bumper 8167495
3—Pin 8525255 (2)
4—Retaining ring 583280 (2)
5—¼-28 x ⅜ fl-pt setscrew MS51026-62 [1]
6—¼-28 x ⅝ fl-hd screw MS24668-11 [2]
7—Shim 9977153 [2]
8—Hook assembly 8525259
A—¼-28 x 3/16 cup-pt setscrew MS51018-63
B—¼-28 x ⅜ ½-dog-pt setscrew MS51042-46
C—Pin 8525257
D—⅞-id x 1½-od x 0.063 thk fl washer 8167026
E—Roller 8167019
F—Hook 8525258

[1] Used on six hook assemblies
[2] Used on two foremost hook assemblies

Figure 240. Hook assembly—removal, disassembly, assembly, and installation—typical.

Section IX. MAINTENANCE OF LAUNCHING-HANDLING RAIL INCHING DEVICE

132. General

This section describes maintenance of the driver wheel housing assembly (fig. 241), driver wheel assembly, and a handwheel comprising each of the two inching devices (fig. 218). Inching devices are located inside the outriggers at the right front and left rear. The general precautions described in paragraph 105 must be observed when performing any maintenance on these items.

133. Driver Wheel Housing Assembly

Typical procedures for removal and installation of the driver wheel housing assembly are described in *a* through *d* below.

a. Removal.

(1) Remove launching-handling rail as described in paragraph 36*c*(1).

(2) Remove handwheel (fig. 241).

(3) Remove driver wheel housing assembly.

b. Disassembly. Disassemble the driver wheel housing assembly.

c. Assembly.

(1) Install two sleeve bearings in a housing.

Caution: **Keep the two bearings alined and avoid burring or chipping.**

(2) Install lubrication fitting in spur gear shaft.

(3) Assemble remaining parts of housing assembly.

d. Installation.

(1) Position housing assembly in launching-handling rail.

(2) Install machine key in keyway of housing assembly.

(3) Install handwheel.

(4) Install launching-handling rail as described in paragraph 36*c*(2).

134. Driver Wheel Assembly

Typical procedures for removal and installation of the driver wheel assembly (fig. 241) are described in *a* and *b* below.

a. Removal.

(1) Remove the launching-handling rail as described in paragraph 36*c*(1).

(2) Remove hook assembly (fig. 240) from driver wheel to be replaced as described in paragraph 131*a*.

(3) Remove driver wheel housing assembly (fig. 241) as described in paragraph 133*a*.

(4) Remove holder.

(5) Remove axle and driver wheel assembly.

b. Installation.

(1) Position driver wheel assembly in launching-handling rail.

(2) Install axle and holder.

(3) Install driver wheel housing assembly as described in paragraph 133*d*.

(4) Install hook assembly (fig. 240) as described in paragraph 131*d*.

(5) Install launching-handling rail as described in paragraph 36*c*(2).

Section X. MAINTENANCE OF LAUNCHING-HANDLING RAIL IDLER WHEEL ASSEMBLY

135. General

This section describes maintenance of the launching-handling rail idler wheel assemblies (fig. 242). The general precautions described in paragraph 105 must be observed when performing any maintenance on this item.

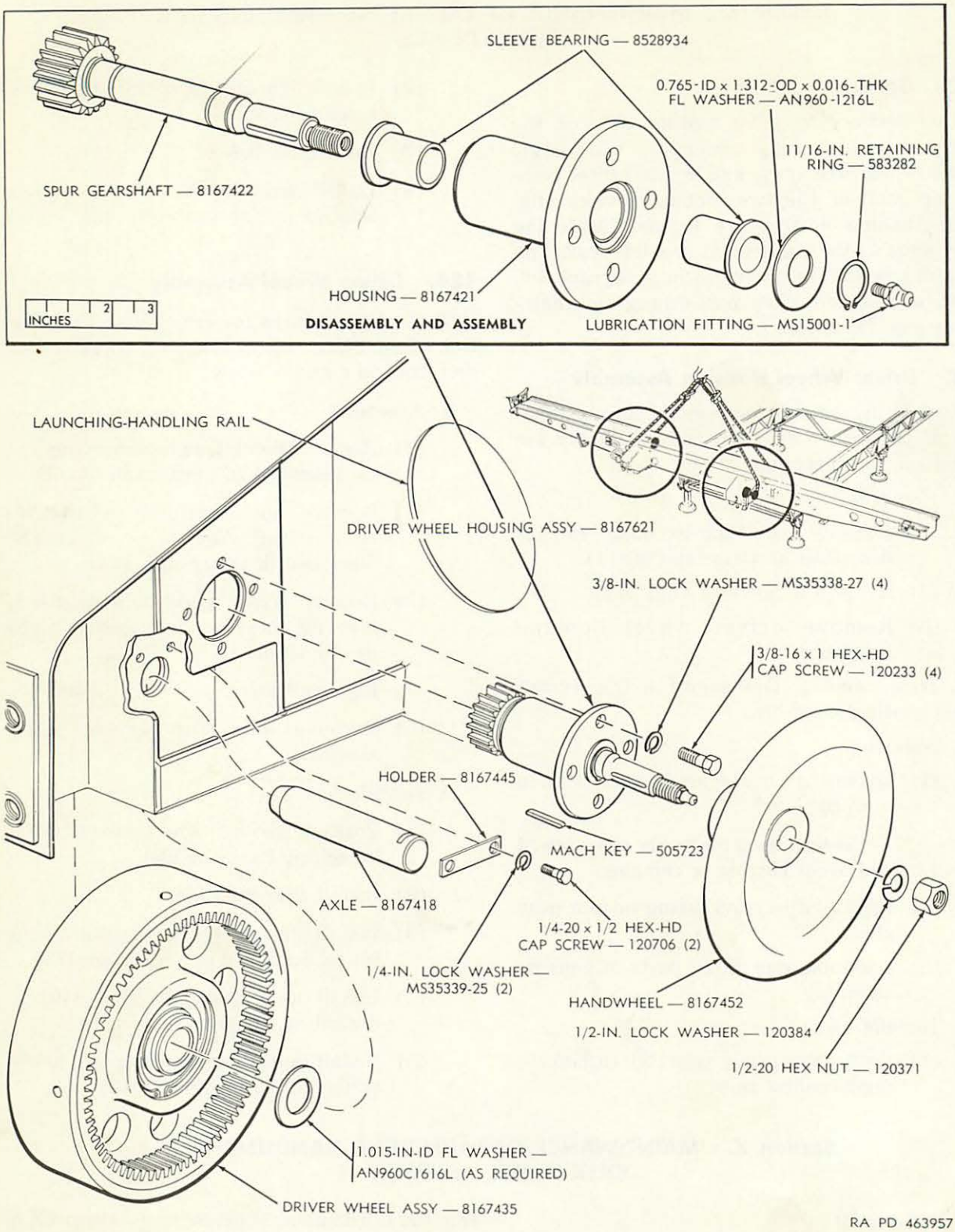


Figure 241. Inching device – removal and installation – typical.

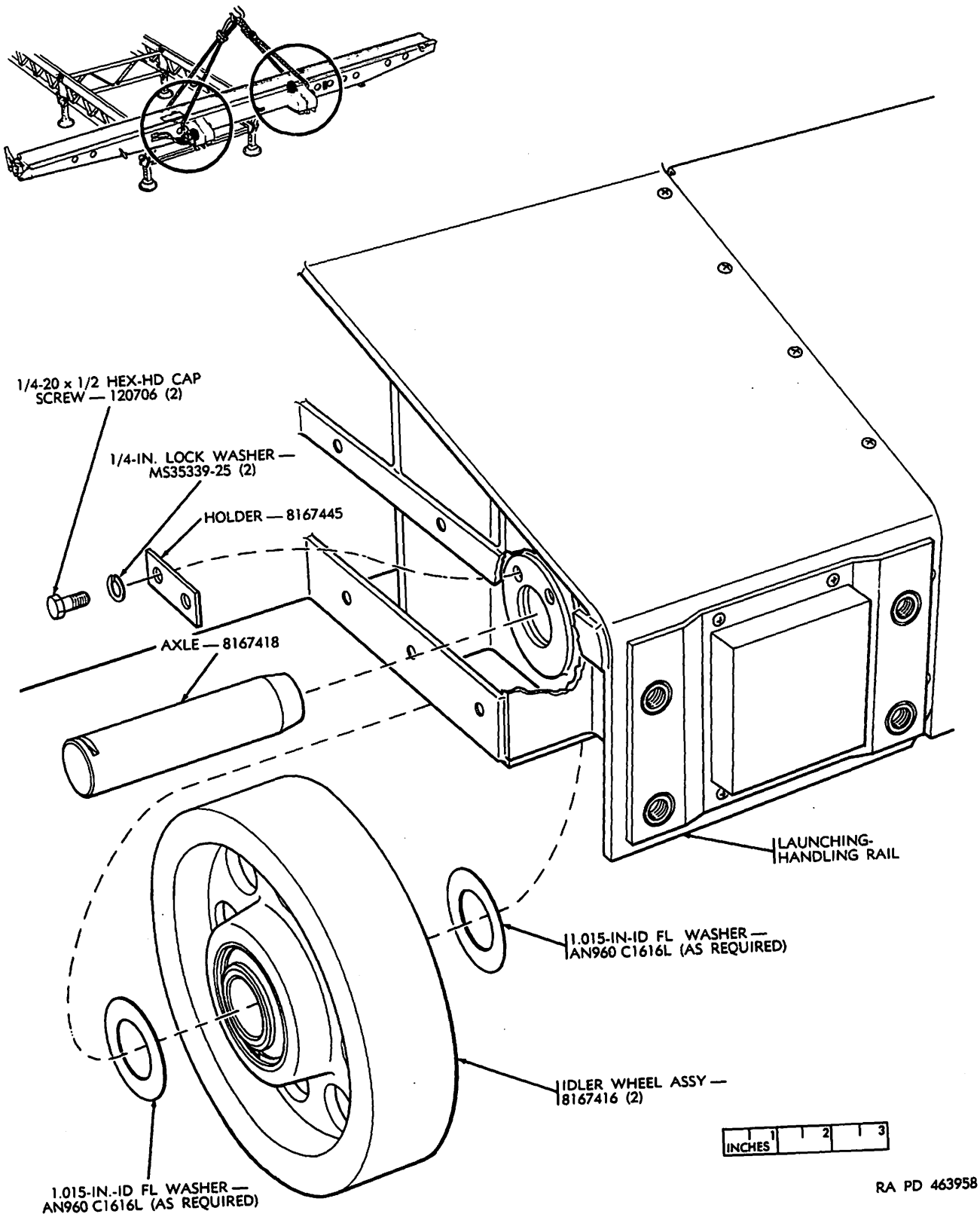


Figure 242. Idler wheel assembly — removal and installation — typical.

136. Idler Wheel Assembly

The idler wheel assemblies are located in the outriggers (fig. 218) at the left front and right rear. Typical procedures for removal and installation of the idler wheel assemblies (fig. 242) are described in *a* and *b* below.

a. Removal.

(1) Remove launching-handling rail as described in paragraph 36*c*(1).

(2) Remove hook assembly (fig. 240) from idler wheel assembly requiring replacement as described in paragraph 131*a*.

(3) Remove idler wheel assembly (fig. 242).

b. Installation.

(1) Install idler wheel assembly.

(2) Install hook assembly (fig. 240) as described in paragraph 131*d*.

(3) Install launching-handling rail as described in paragraph 36*c*(2).

Section XI. MAINTENANCE OF RAIL RELEASE ASSEMBLY

137. General

This section describes maintenance of the rail release assembly (fig. 243). The general precautions described in paragraph 105 must be observed when performing any maintenance on this item.

138. Rail Release Assembly

The release assembly is attached to the front end of the launching-handling rail.

Note. The key numbers shown in parentheses in *a* through *d* below refer to figure 243.

a. Removal. Remove release assembly (4).

b. Disassembly.

(1) Remove cotter pin (4A), two knobs (4B), and washer (4C) from holder (4E).

(2) Remove holder (4E) from coupling (4P).

(3) Remove shear bolt (4H) and thumbscrew (4D).

(4) Remove two setscrews (4J) and two headed straight pins (4K).

(5) Remove yoke assembly (4L).

(6) Remove headless straight pin (4N) and two sleeve bushings (4Q) from yoke assembly (4L).

(7) Remove four sleeve bearings (4M) and two lubrication fittings (4R) from yoke assembly (4L).

(8) Remove two headless straight pins (4T) from bracket assembly (4CC).

1 — 5/8-11 hex. nut MS35690-1005 (8)
2 — 5/8-in. lockwasher MS35338-50 (8)
3 — 5/8-11 x 2-1/4 hex-hd cap screw MS35297-165 (8)
4 — Rail release assy 9032212
A — 1/16 x 1 cotter pin MS24665-155
B — Knob 9020398 (2)
C — 17/32-id x 1-1/16-od fl washer MS15795-222
D — 1/4-20 x 1-3/4 int wrenching bolt 591008 (1081 through 5379) or 1/4-20 x 1-1/2 thumbscrew 9151815 (5380 and subs)
E — Holder 9020383
F — 3/8-24 hex. nut MS35691-630
G — 3/8-in. lockwasher MS35338-84
H — 3/8-24 x 5.74 shear bolt 8521882
H.1 — 0.032-in. lockwire MS20995N32-10
J — 1/4-20 x 5/8 setscrew MS51017-68 (2)
K — Headed str pin 8524381 (2)
L — Yoke assy 9032143
M — Sleeve bearing 8524385 (4)
N — Hdls str pin 9020397
P — Coupling 9020401
Q — Sleeve bushing 9151643 (2) (1081 through 5940) or 9020399 (2) (5941 and subs)
R — Lubrication fitting MS15001-1 (2)
S — 1/8 x 3/4 spg pin MS9047-104 (4)
T — 1/2 x 3-3/8 hdls str pin 9032136 (2) (1081 through 4099) or 1/2 x 3-3/8 hdls str pin 9020381 (2) (4100 and subs)
U — 0.531-id x 1.062-od fl washer MS15795-218 (4)
V — 1/4-20 x 5/8 hex-hd cap screw MS35297-3 (2)
W — 1/4-in. lockwasher MS35338-25 (2)
X — Release assy housing 8524384
Y — 1/8 x 3/4 spg pin MS9047-104
Z — 0.531-ld x 1.062-od fl washer MS15795-218
AA — Spring 8165440
BB — Pin 8524377
CC — Bracket assy 9032134
5 — Launching-handling rail

Figure 243. Rail release assembly—removal and installation—legend.

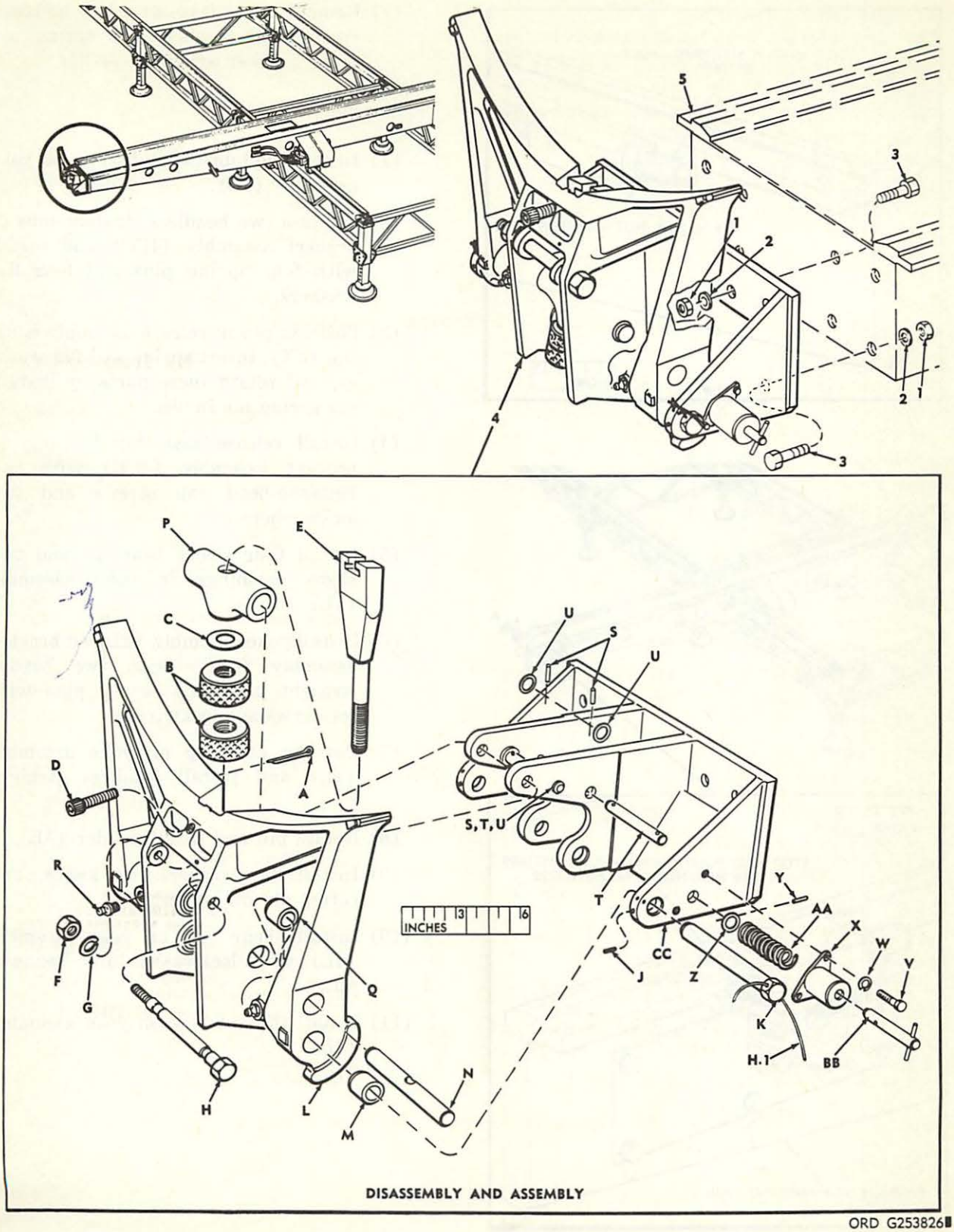


Figure 243. Rail release assembly – removal and installation.

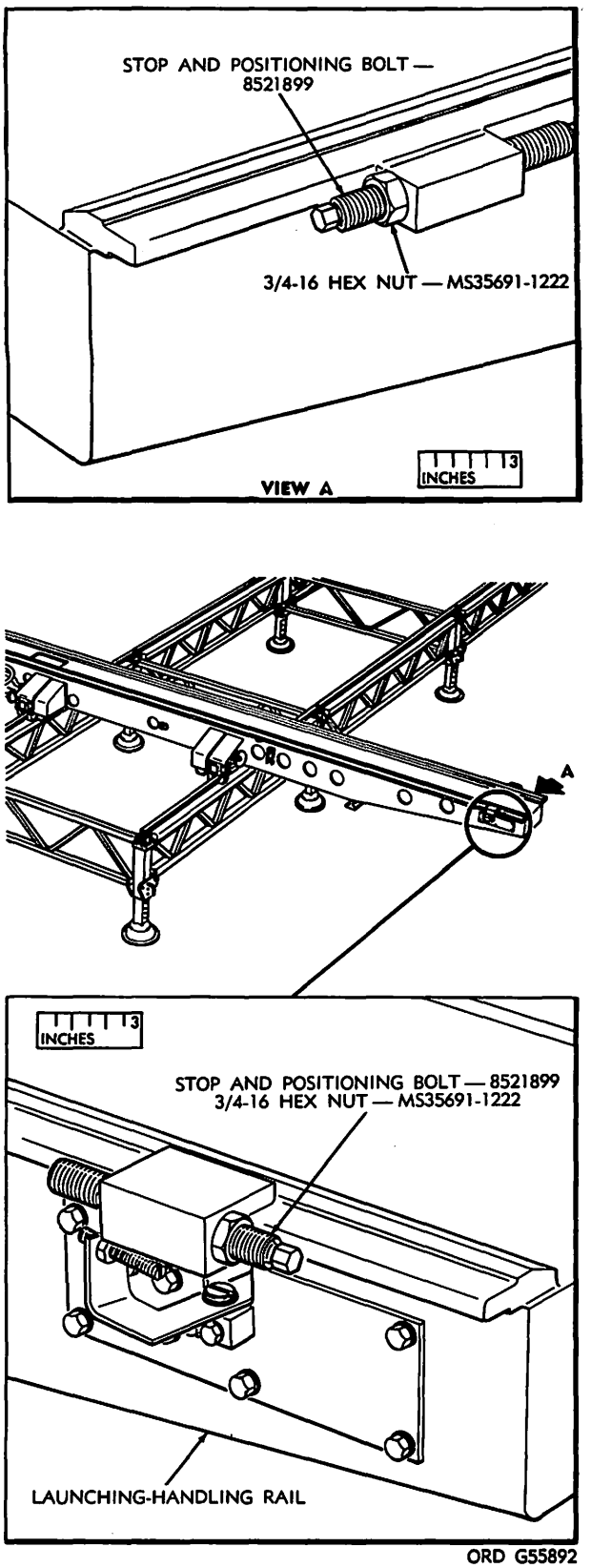


Figure 244. Stop and positioning bolt—removal and installation.

(9) Remove pin, release assembly housing, spring, flat washer, and spring pin from bracket assembly (4CC).

c. Assembly.

(1) Install two lubrication fittings on yoke assembly (4L).

(2) Position two headless straight pins in bracket assembly (4CC) and install with four spring pins and four flat washers.

(3) Position pin in release assembly housing (4X), insert spring and flat washer, and retain these parts by installing spring pin in pin.

(4) Install release assembly housing on bracket assembly (4CC) with two hexagon-head cap screws and two lockwashers.

(5) Install four sleeve bearings and two sleeve bushings in yoke assembly (4L).

(6) Install yoke assembly (4L) on bracket assembly (4CC) with two headed straight pins, and secure pins with setscrews and lockwire.

(7) Position coupling on yoke assembly (4L) and install headless straight pin.

(8) Rotate pin and install holder (4E).

(9) Install flat washer, two knobs, and cotter pin on holder (4E).

(10) Install shear bolt on yoke assembly (4L) with lockwasher and hexagon nut.

(11) Install thumbscrew on yoke assembly (4L).

d. Installation.

(1) Position rail release assembly (4) on launching-handling rail (5) and secure top of release assembly to rail with hexagon-head cap screws (3), lockwashers (2), and hexagon nuts (1).

(2) Secure bottom of release assembly (4) to rail (5) with hexagon-head cap screws (3), lockwashers (2), and hexagon nuts (1).

(3) Torque hexagon nuts at top of release assembly and hexagon-head cap screws at bottom of release assembly to 1,100 pound-inches.

139. Stop and Positioning Bolt

A stop and positioning bolt (fig. 244) is installed on each side of the launching-handling rail for the purpose of properly alining the rocket motor cluster on the rail. Refer to TM 9-1440-250-20 for adjustment of bolt.

Section XII. MAINTENANCE OF GUIDANCE SET COOLING SYSTEM

139.1. General

This section covers maintenance of the guidance set cooling system. The general precautions described in paragraph 105 must be observed when performing any maintenance on this system.

139.2 Guidance Set Cooling System

a. Removal of Guidance Set Cooling System.

Note. The key numbers shown in parentheses in (1) through (4) below refer to figure 244.1.

(1) Remove cover (3).

(2) Remove blower assembly and mount group (9) as described in paragraph 114.1*a* (2) through (4).

(3) Remove hose (8).

(4) Remove mounts (9C).

Note. The key numbers shown in parentheses in (5) through (7) below refer to figure 244.2.

(5) Remove hose assembly (4).

(6) Remove mounting plate (12) and pipe (13).

(7) Remove bracket (17).

b. Installation of Guidance Set Cooling System.

Note. The key numbers shown in parentheses in (1) through (3) below refer to figure 244.2.

(1) Install bracket (17).

(2) Install pipe (13) and mounting plate (12).

(3) Install hose assembly (4).

Note. The key numbers shown in parentheses in (4) through (7) below refer to figure 244.1.

(4) Install mounts (9C) on blower assembly (9D).

(5) Position hose (8) inside launching-handling rail (10).

(6) Install blower assembly and mount group (9) as described in paragraph 114.1*b* (5) through (7).

(7) Install cover (3).

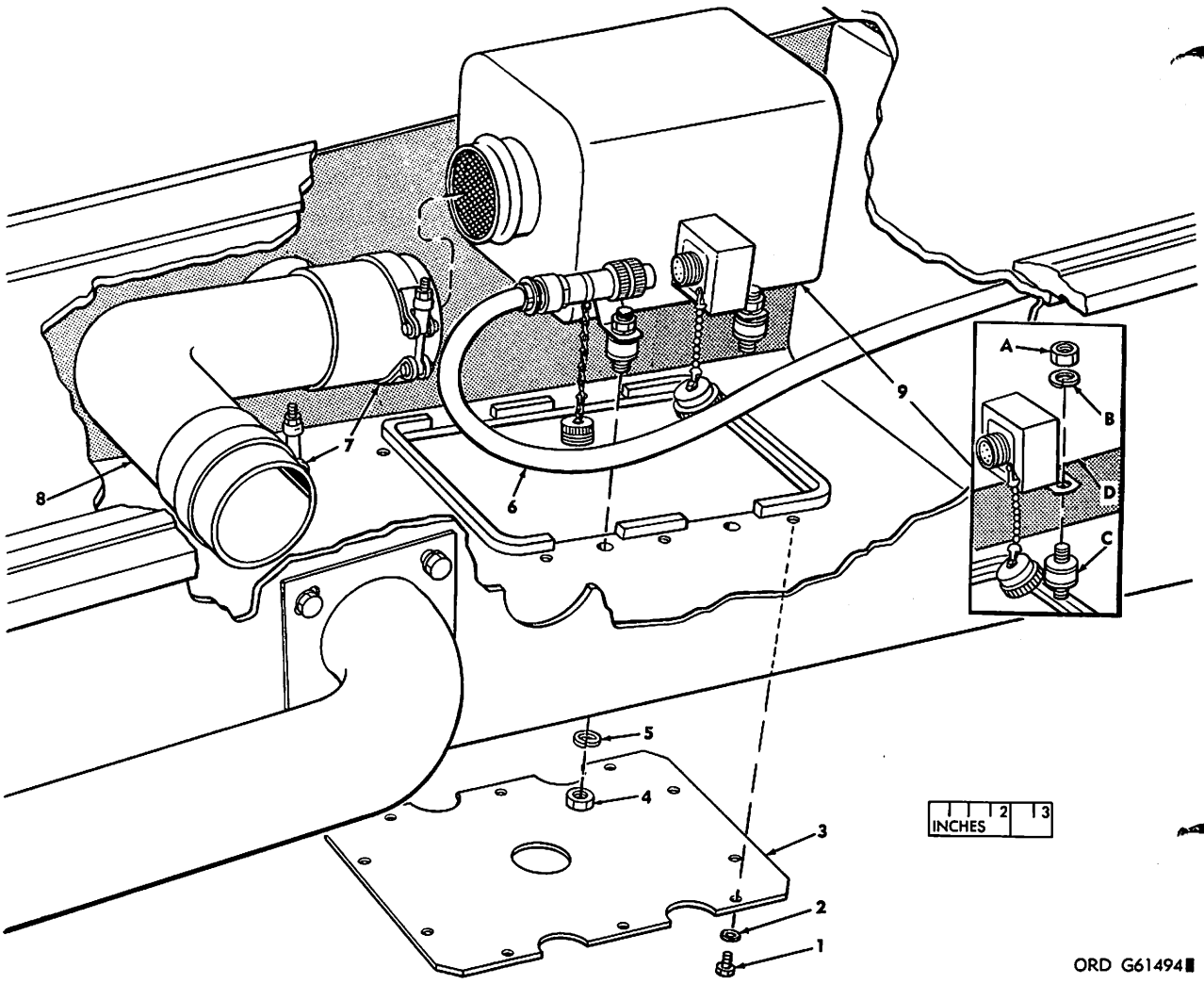
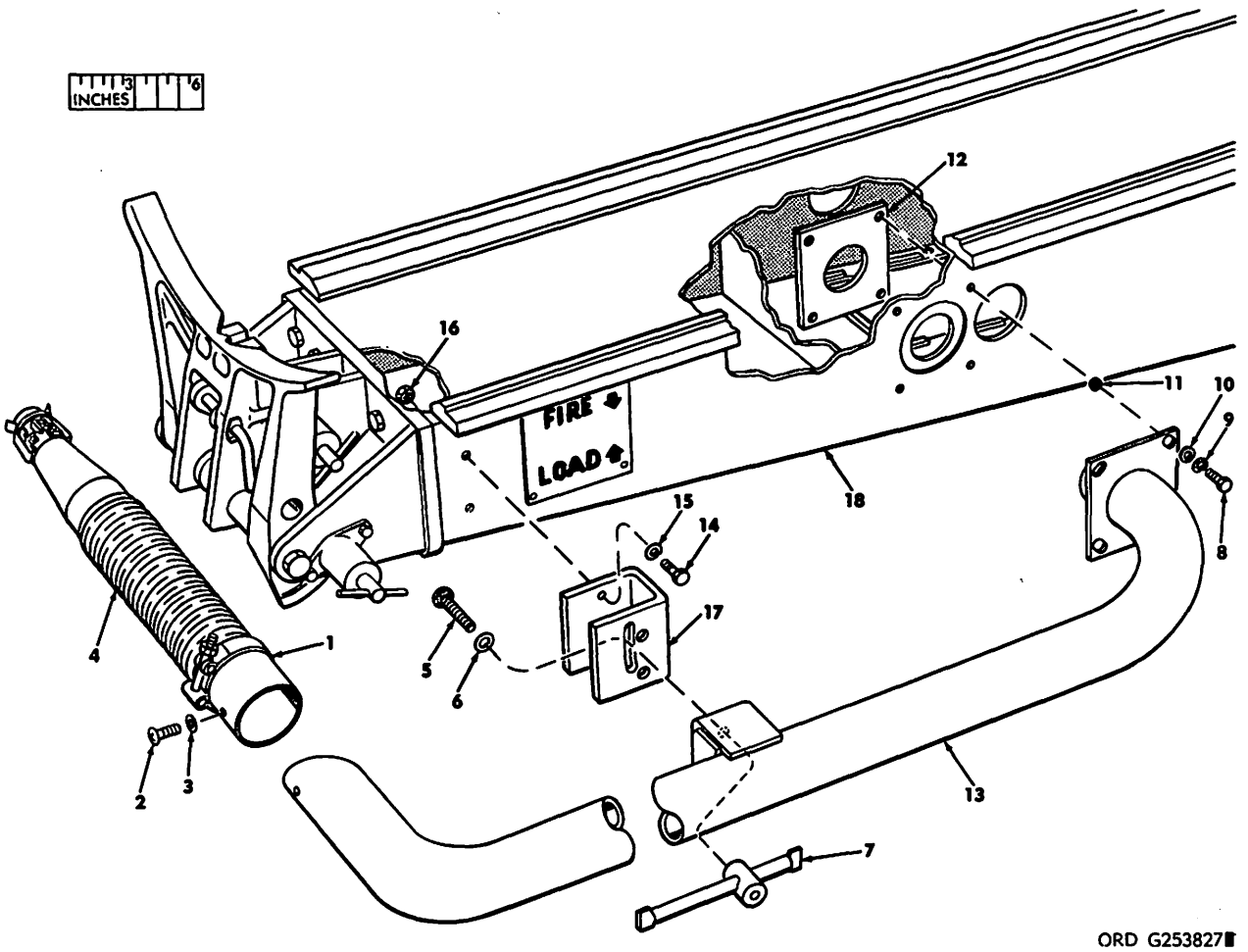


Figure 244.1. Guidance set cooling system—removal and installation.

1—¼-28 x ⅝ hex-hd cap screw MS35298-5 (10)
2—0.281-in-id fl washer MS15795-210 (10)
3—Cover 9034320
4—¼-20 hex nut MS35690-402 (4)
5—¼-in. lockwasher MS35338-44 (4)
6—Guidance set cooling system cable assembly
7—Retaining band
8—Hose 9025044
9—Blower assembly and mount group
A—¼-20 hex nut MS35690-402 (4)
B—¼-20 lockwasher MS35338-44 (4)
C—Mount 9025243 (4)
D—Blower assembly 9031878
10—Launching-handling rail



1—Retaining band
2—1/4-28 x 3/8 rd-hd screw 8527638 (2)
3—0.281-in-id fl washer MS15795-310 (2)
4—Hose assy 9029814
5—1/2-13 x 1 rd-hd bolt MS35751-123
6—0.812-in-id fl washer MS15795-222
7—1/2-13 rd nut with bar 9977597
8—3/8-24 x 1-13/64 hex-hd bolt AN6C11A (4)
9—3/8-in. lockwasher MS35338-46 (4)
10—0.39-in-id fl washer MS63040-6 (4)
11—0.402-in-id spacer NAS43HT6-13 (4)
12—Mounting plate 9977598
13—Pipe 9977579
14—3/8-24 x 61/64 hex-hd bolt AN6C7A (2)
15—3/8-in. lockwasher MS35338-46 (2)
16—3/8-24 hex nut MS35690-630 (2)
17—Bracket 9977596
18—Launching-handling rail

Figure 244.2. Guidance set cooling system—removal and installation—Continued.

CHAPTER 8

MAINTENANCE OF LAUNCHER TRANSPORT MODIFICATION KIT

Section I. General

140. Scope

This chapter contains maintenance information covering the launcher transport modification kit that is within the scope of field maintenance personnel. The scope of field maintenance is determined by the listing of field maintenance parts in TM 9-1440-250-35P/1 and the listing of special tools for field maintenance personnel in Department of the Army Supply Manual 9-4-4935-J29-4.

141. References

Organizational maintenance of the launcher transport modification kit is covered in TM 9-1440-250-20. A complete set of schematic diagrams is furnished in TM 9-1440-251-20 and wiring diagrams are provided in TM 9-1440-250-35. General maintenance procedures are given in chapter 4. Individual references to chapter 4 are not made within this chapter. It is therefore especially important that personnel become familiar with the contents of chapter 4.

Section II. MAINTENANCE OF LAUNCHER TRANSPORT MODIFICATION KIT ELECTRICAL SYSTEM

142. General

This section covers maintenance of the electrical system of the launcher transport modification kit and includes the stop light-taillight, lamp assembly, two clearance lamps, cable connections, and the launcher-to-prime mover cable assembly.

143. Stop Light-Taillight and Lamp Assembly

The stop light-taillight and lamp assembly (fig. 245) are stowed in the cavity at the front of the running gear. These taillights are installed on the right and left rear corners of the launcher base assembly when it is being transported on the running gear. Typical removal, disassembly, assembly, and installation procedures are described in *a* through *f* below:

a. Removal from Running Gear. Remove stop light-taillight or lamp assembly from cavity at front of running gear.

b. Removal from Launcher Base Assembly. Remove stop light-taillight or lamp assembly from launcher base assembly.

c. Disassembly.

(1) Remove door group (Q2 or R2 fig. 246).

(2) Remove marker light group (Q3 or R3, fig. 246).

(3) Disassemble stop light-taillight or lamp assembly as required.

(4) Disassemble door group (fig. 247).

(5) Disassemble marker light group.

d. Assembly.

(1) Assemble marker light group.

(2) Assemble door group.

(3) Assemble stop light-taillight or lamp assembly (fig. 246) and make required cable connections (fig. 248).

e. Installation on Launcher Base Assembly (fig. 245). Install stop light-taillight or lamp assembly on launcher base assembly and connect each cable to receptacle connector on launcher base assembly.

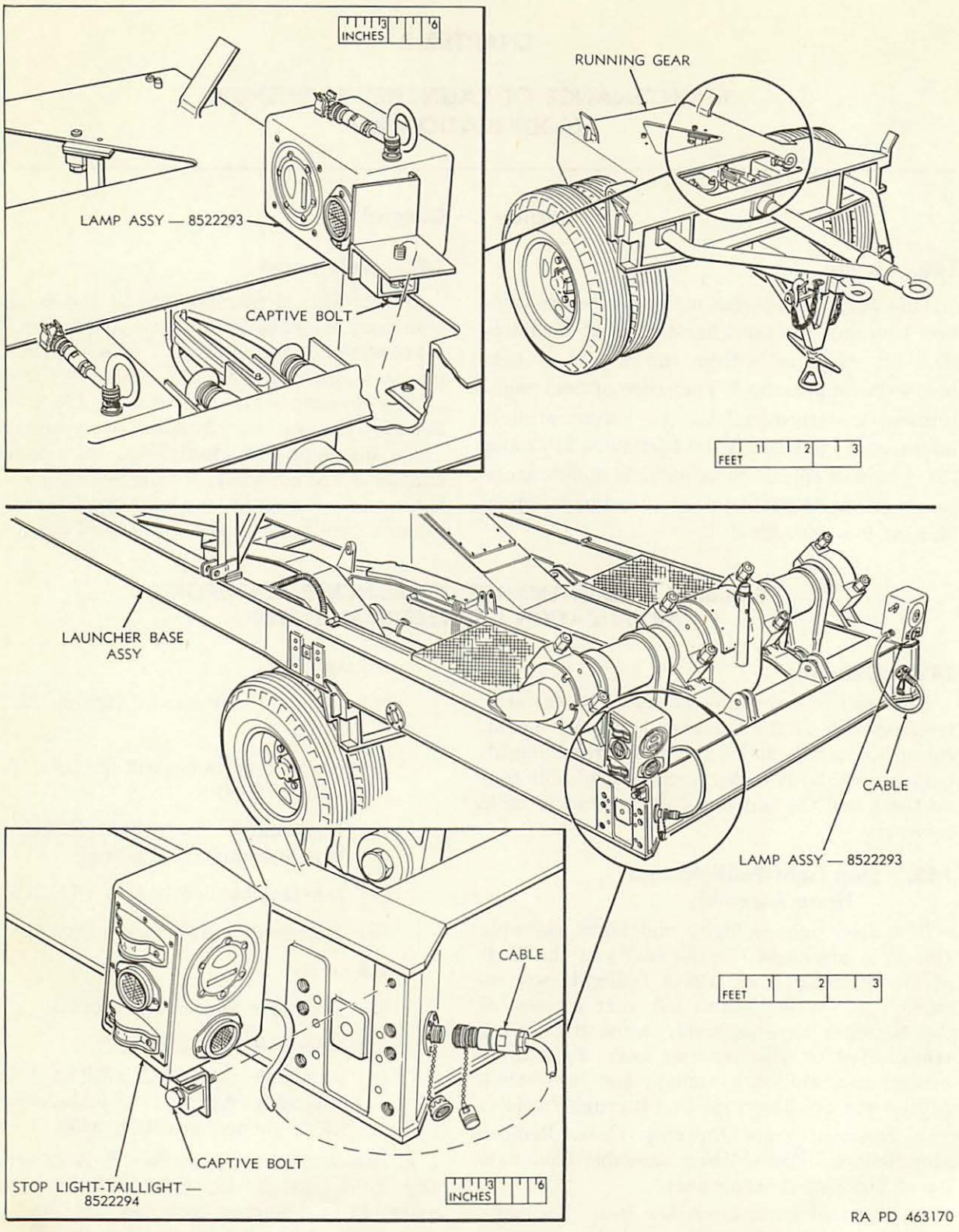
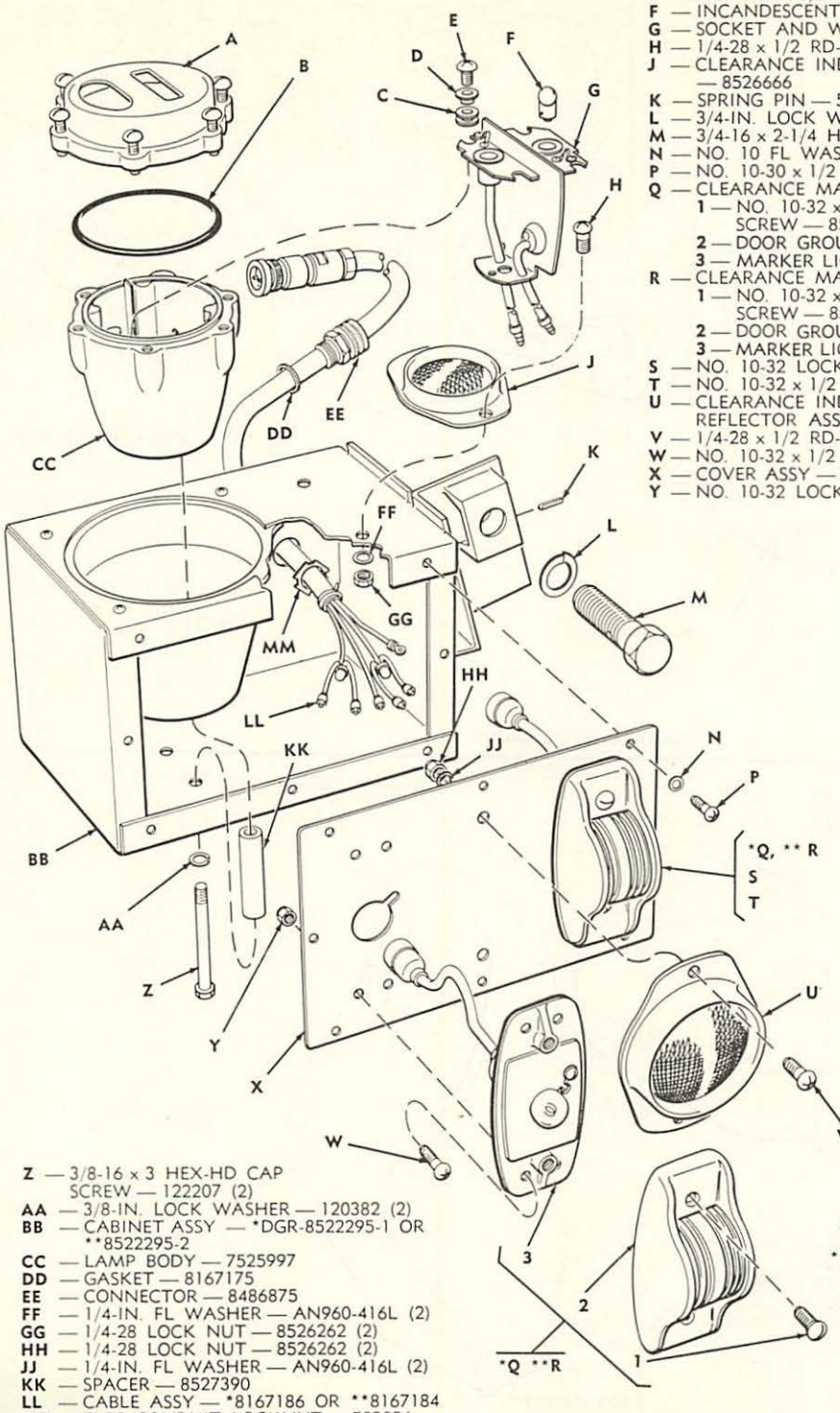


Figure 245. Stop light-taillight and lamp assembly – removal and installation.



A — DOOR ASSY — 7526018
B — PREFORMED PACKING — 7320658
C — GROMMET — 7526006 (4)
D — EYELET — 7978343 (4)
E — NO. 8-32 x 3/8 RD-HD SCREW — 121832 (7)
F — INCANDESCENT LAMP — ENG-6240-019-0877 (2)
G — SOCKET AND WIRING ASSY — 7350595
H — 1/4-28 x 1/2 RD-HD SCREW — AN520C-416R8 (2)
J — CLEARANCE INDICATING REFLECTOR ASSY — 8526666
K — SPRING PIN — 585938
L — 3/4-IN. LOCK WASHER — MS35338-32
M — 3/4-16 x 2-1/4 HEX-HD BOLT — 8530305
N — NO. 10 FL WASHER — AN960-10L (8)
P — NO. 10-30 x 1/2 RD-HD SCREW — AN520C-10R8 (8)
Q — CLEARANCE MARKER LIGHT ASSY — 7954598
  1 — NO. 10-32 x 3/8 RD-HD SCREW — 8527023 (2)
  2 — DOOR GROUP
  3 — MARKER LIGHT GROUP
R — CLEARANCE MARKER LIGHT ASSY — 7954597
  1 — NO. 10-32 x 3/8 RD-HD SCREW — 8527023 (2)
  2 — DOOR GROUP
  3 — MARKER LIGHT GROUP
S — NO. 10-32 LOCK NUT — 8526043 (4)
T — NO. 10-32 x 1/2 RD-HD SCREW — AN520C-10R8 (4)
U — CLEARANCE INDICATING REFLECTOR ASSY — 8526666
V — 1/4-28 x 1/2 RD-HD SCREW — AN520C-416R8 (2)
W — NO. 10-32 x 1/2 RD-HD SCREW — AN520C-10R8 (2)
X — COVER ASSY — 8167988
Y — NO. 10-32 LOCK NUT — 8526043 (2)

Z — 3/8-16 x 3 HEX-HD CAP SCREW — 122207 (2)
AA — 3/8-IN. LOCK WASHER — 120382 (2)
BB — CABINET ASSY — *DGR-8522295-1 OR **8522295-2
CC — LAMP BODY — 7525997
DD — GASKET — 8167175
EE — CONNECTOR — 8486875
FF — 1/4-IN. FL WASHER — AN960-416L (2)
GG — 1/4-28 LOCK NUT — 8526262 (2)
HH — 1/4-28 LOCK NUT — 8526262 (2)
JJ — 1/4-IN. FL WASHER — AN960-416L (2)
KK — SPACER — 8527390
LL — CABLE ASSY — *8167186 OR **8167184
MM — ELEC CONDUIT LOCKNUT — 503056

*PART OF LAMP ASSY — 8522293

**PART OF STOP LIGHT-TAILLIGHT — 8522294

RA PD 463837

Figure 246. Stop light-taillight and lamp assembly — disassembly and assembly.

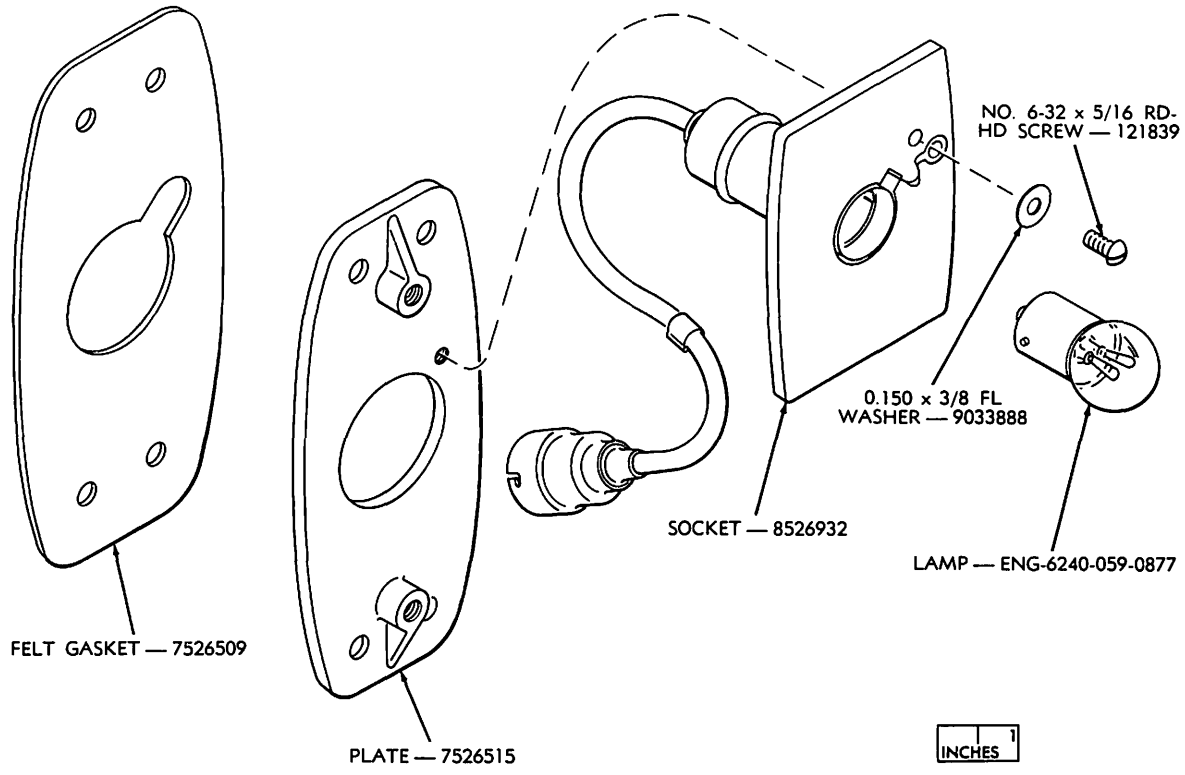


Figure 247. Door group and marker light group – disassembly and assembly.

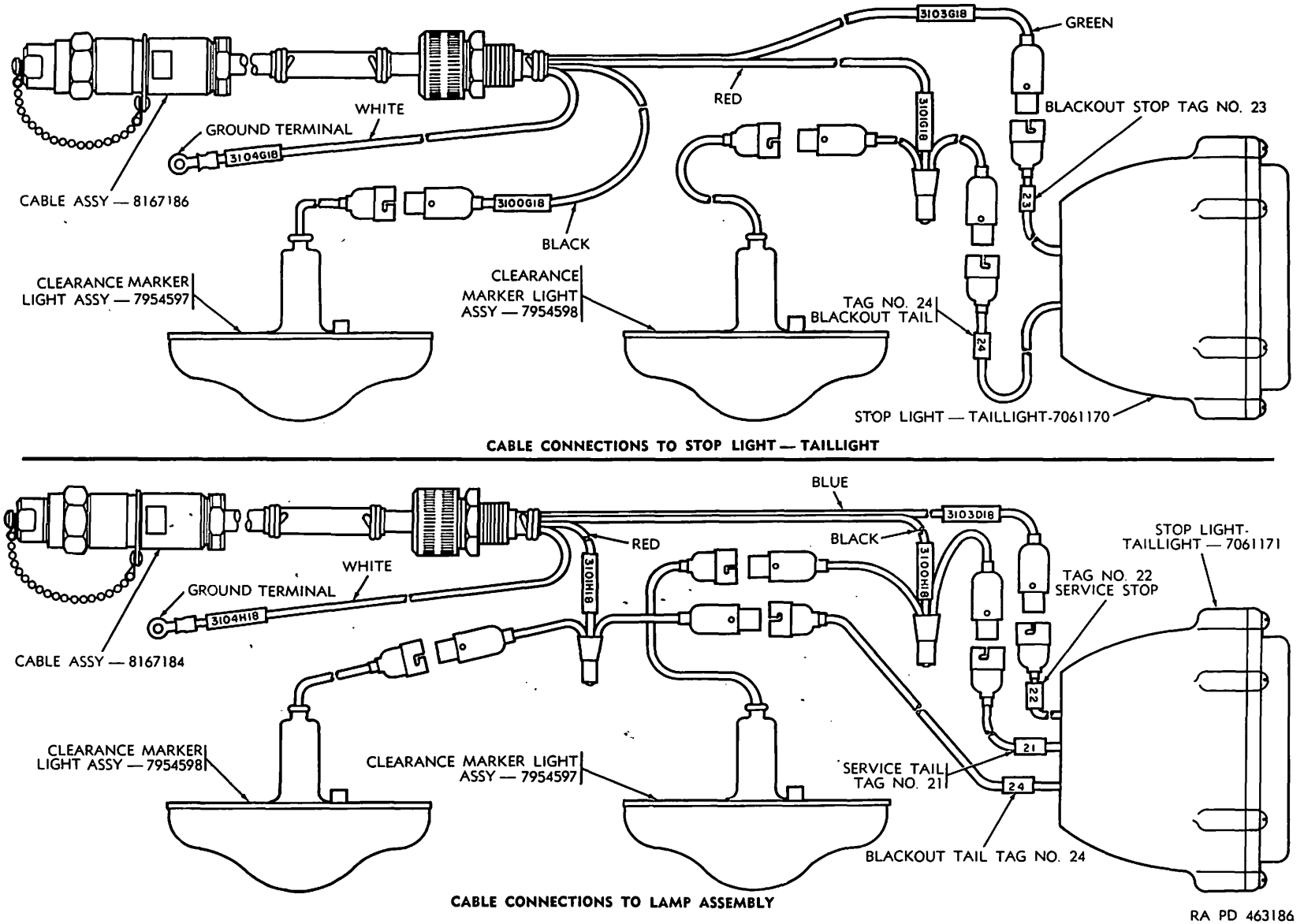


Figure 248. Running gear tail lamp assemblies – cable connections.

f. Installation in Running Gear (fig. 245). Install stop light-taillight or lamp assembly in cavity at front of running gear.

144. Clearance Lamp Assemblies

Two clearance lamp assemblies (fig. 249) are stowed in the cavity at the rear of the running gear. They are installed on the right and left front corners of the launcher base assembly when it is being transported on the running gear. Typical removal, disassembly, assembly, and installation procedures are listed in *a* through *f* below.

a. Removal from Running Gear. Remove clearance lamp assemblies from cavity at the rear of the running gear.

b. Removal from Launcher Base Assembly. Remove clearance lamp assemblies from launcher base assembly.

c. Disassembly.

(1) Remove door group (G2 or M2, fig. 250).

(2) Remove marker light group (G3 or M3, fig. 250).

(3) Disassemble clearance lamp assembly as required.

(4) Disassemble door group (fig. 247).

(5) Disassemble marker light group.

d. Assembly.

(1) Assemble marker light group.

(2) Assemble door group.

(3) Assemble clearance lamp assembly (fig. 250) and make required cable connections (fig. 251).

e. Installation on Launcher Base Assembly (fig. 249). Install clearance lamp assemblies on launcher base assembly and connect each cable to receptacle on launcher base assembly.

f. Installation in Running Gear (fig. 249). Install clearance lamp assemblies in cavity at the rear of running gear.

145. Launcher-to-Prime Mover Cable Assembly

a. Removal. Disconnect launcher-to-prime mover cable assembly (fig. 252) between Hercules monorail launcher assembly and prime mover, or remove from running gear as required.

Note. Refer to TM 9-1440-251-10 for launcher assembly emplacement or mode of transportation using prime mover.

b. Installation. Connect cable assembly between launcher and prime mover or stow in cavity at front of running gear as required.

Section III. MAINTENANCE OF RUNNING GEAR

146. General

This section covers maintenance of the retractable support, pintle assembly, quick-release pin, bracket and brace, cap screws, and the mechanical and pneumatic components of the brake system.

147. Retractable Support Assembly

The retractable support assembly (fig. 252) connects the Hercules monorail launcher assembly to a prime mover when the launcher assembly is being transported on the running gear. It is stowed underneath the front end of the running gear. While in this position, the adjusting jack link may be extended to support the running gear at its front end. Removal, disassembly, assembly, and installation procedures are described in *a* through *f* below.

***Warning:* Support of the retractable support (weight 276 pounds) with wire ropes during removal and installation of the support is necessary to prevent injury or death to personnel.**

a. Removal from Running Gear.

(1) Place wire ropes under retractable support and attach to hoist hook of hoisting device capable of supporting a minimum of 500 pounds.

(2) Support drawbar yoke by attaching it to prime mover or by other means.

(3) Take slack out of wire ropes.

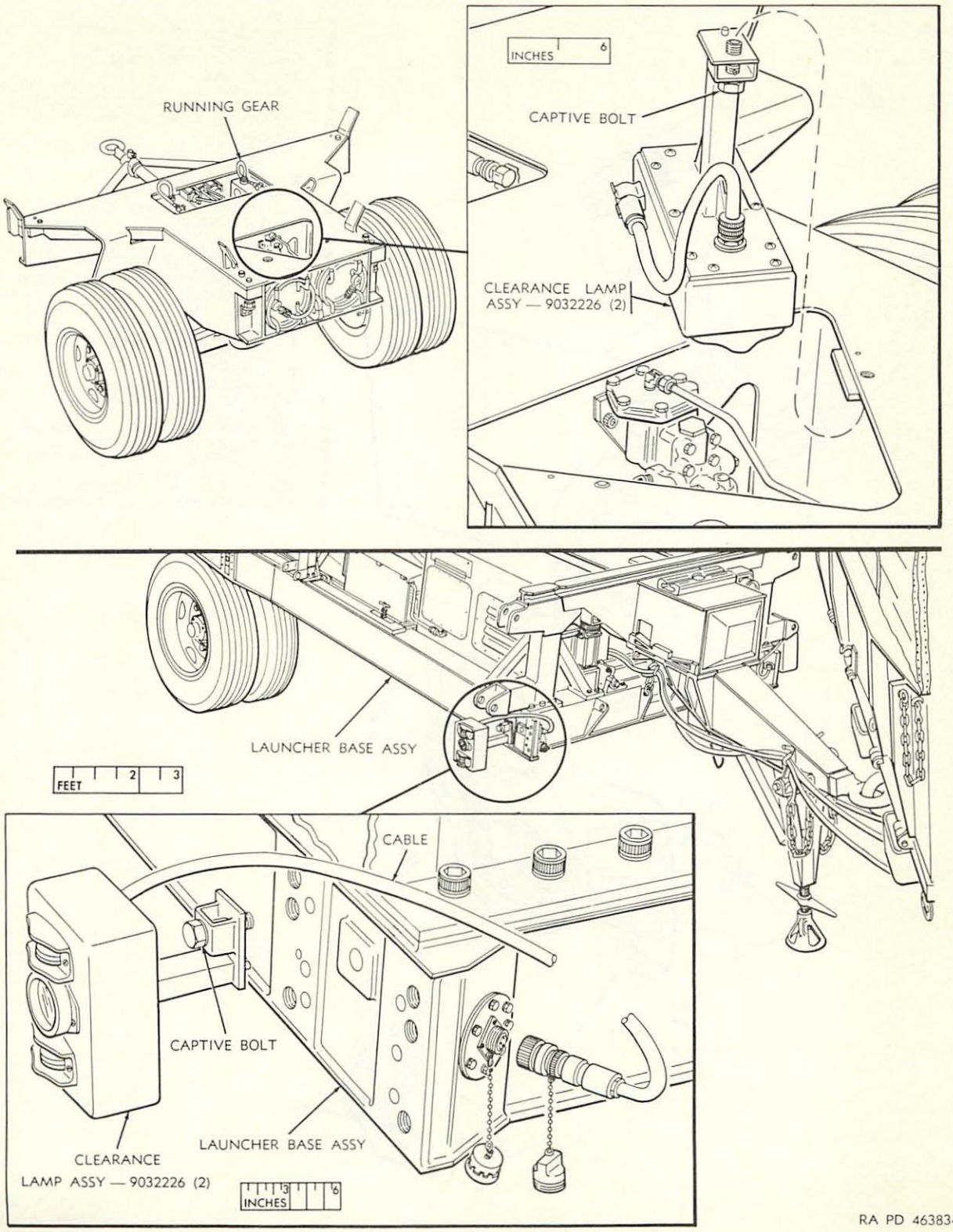
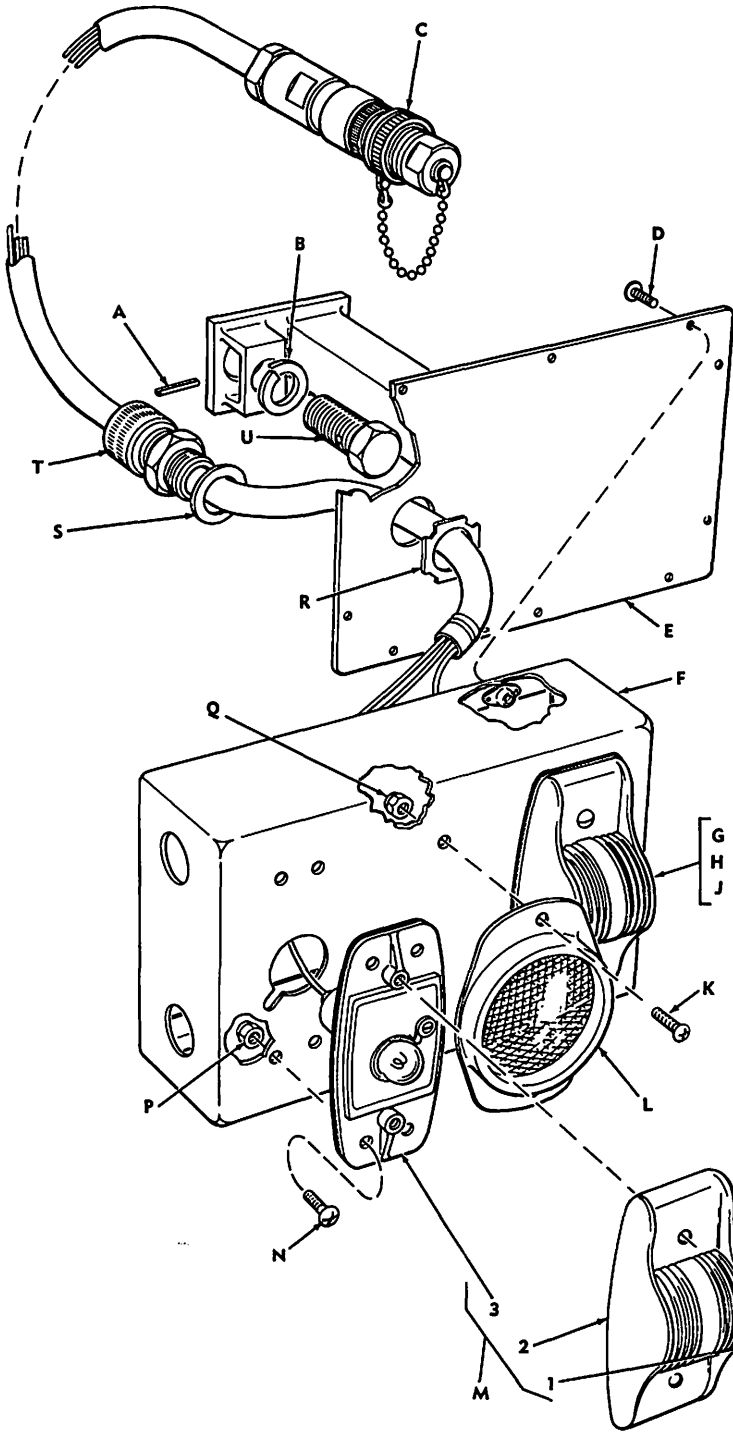


Figure 249. Clearance lamp assembly – removal and installation – typical.



A — 0.125 x 1-1/4 STGHT PIN — 585940
B — 1-IN. LOCK WASHER — MS35337-34
C — CABLE ASSY — 8167188
D — NO. 10-32 x 1/2 RD-HD SCREW — AN520C-10R8 (10)
E — LAMP ASSY SUPPORT — DGR-8167131-501
F — LAMP ASSY HOUSING — DGR-8167607-3
G — CLEARANCE MARKER LIGHT ASSY — 7954595
  1 — NO. 10-24 3/8 OVAL-HD SCREW — 8527023
  2 — DOOR GROUP
  3 — MARKER LIGHT GROUP
H — NO. 10-32 x 1/2 RD-HD SCREW — AN520C-10R8 (2)
J — NO. 10-32 LOCK NUT — 8170388 (2)
K — 1/4-28 x 1/2 RD-HD SCREW — AN520C-416R8 (2)
L — CLEARANCE INDICATING REFLECTOR ASSY — 8526666
M — CLEARANCE MARKER LIGHT ASSY — 7954596
  1 — NO. 10-24 x 3/8 OVAL-HD SCREW — 8527023
  2 — DOOR GROUP
  3 — MARKER LIGHT GROUP
N — NO. 10-32 x 1/2 RD-HD SCREW — AN520C-10R8 (2)
P — NO. 10-32 LOCK NUT — 8170388 (2)
Q — 1/4-28 LOCK NUT — 8170387 (2)
R — ELEC CONDUIT LOCKNUT — 503056
S — GASKET — 8167175
T — CONNECTOR ASSY — 8486875
U — 1-14 x 2-1/4 HEX-HD BOLT — 9032130

RA PD 463226

Figure 250. Clearance lamp assembly – disassembly and assembly – typical.

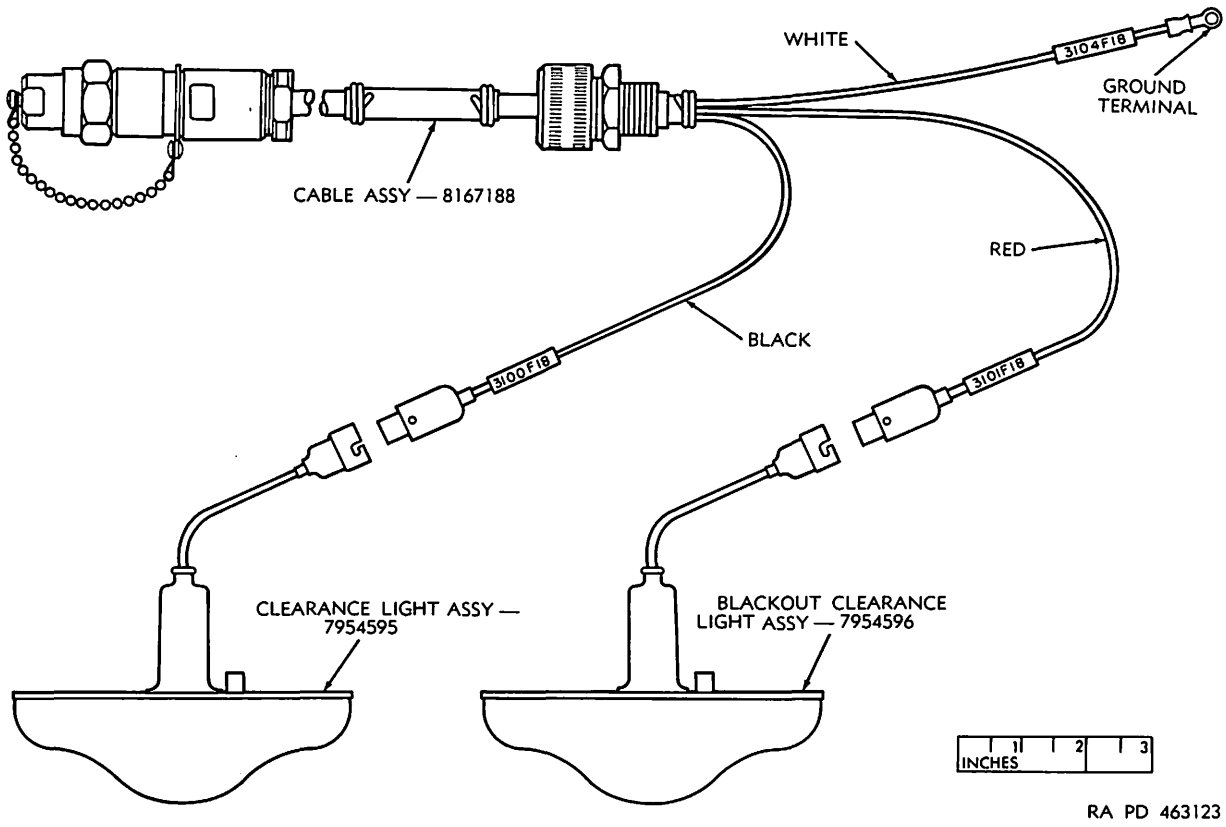


Figure 251. Clearance lamp assemblies — cable connections — typical.

(4) Unscrew four socket cap screws and lower retractable support to ground.

b. Removal from Launcher Erecting Beam Assembly.

(1) Place wire ropes under retractable support and attach to hoist hook of hoisting device capable of supporting a minimum of 500 pounds.

(2) Take slack out of wire ropes.

(3) Disconnect safety chains.

(4) Unscrew four socket cap screws and lower support to ground.

c. Disassembly (fig. 253). Disassemble retractable support assembly.

d. Assembly. Assemble retractable support assembly.

e. Installation on Running Gear (fig. 252).

(1) Place wire ropes under retractable support assembly and attach to hoist hook of hoisting device capable of supporting 500 pounds.

(2) Position the support assembly on the running gear and attach with four socket cap screws.

f. Installation on Launcher Erecting Beam Assembly (fig. 252).

(1) Place wire ropes under retractable support assembly and attach to hoist hook.

(2) Position the support assembly on the erecting beam assembly and attach with four socket cap screws.

(3) Connect safety chains.

148. Pintle Assembly (fig. 254)

a. Removal. Remove pintle assembly from running gear.

b. Installation. Install pintle assembly on running gear.

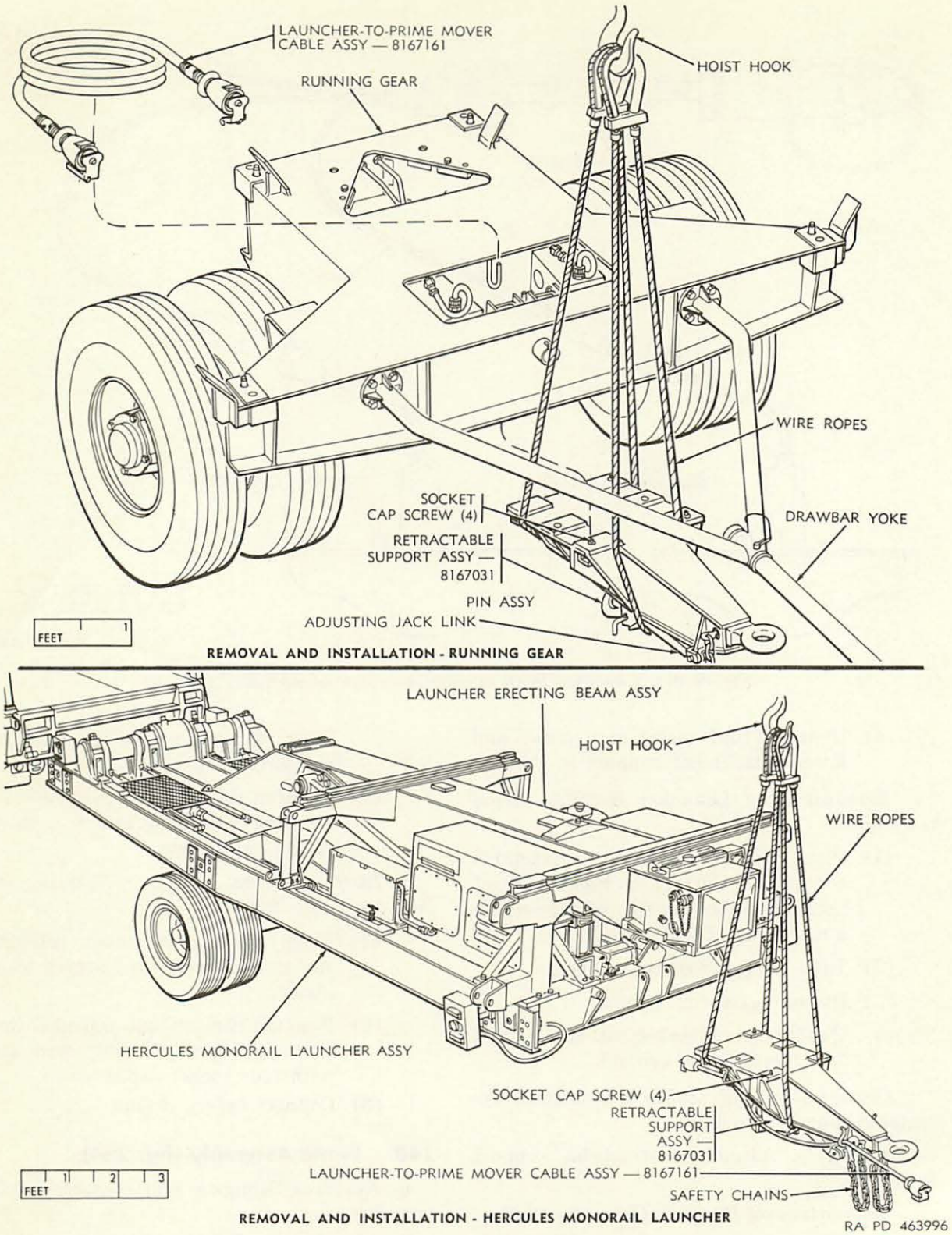


Figure 252. Retractable support and launcher-to-prime mover cable assembly — removal and installation.

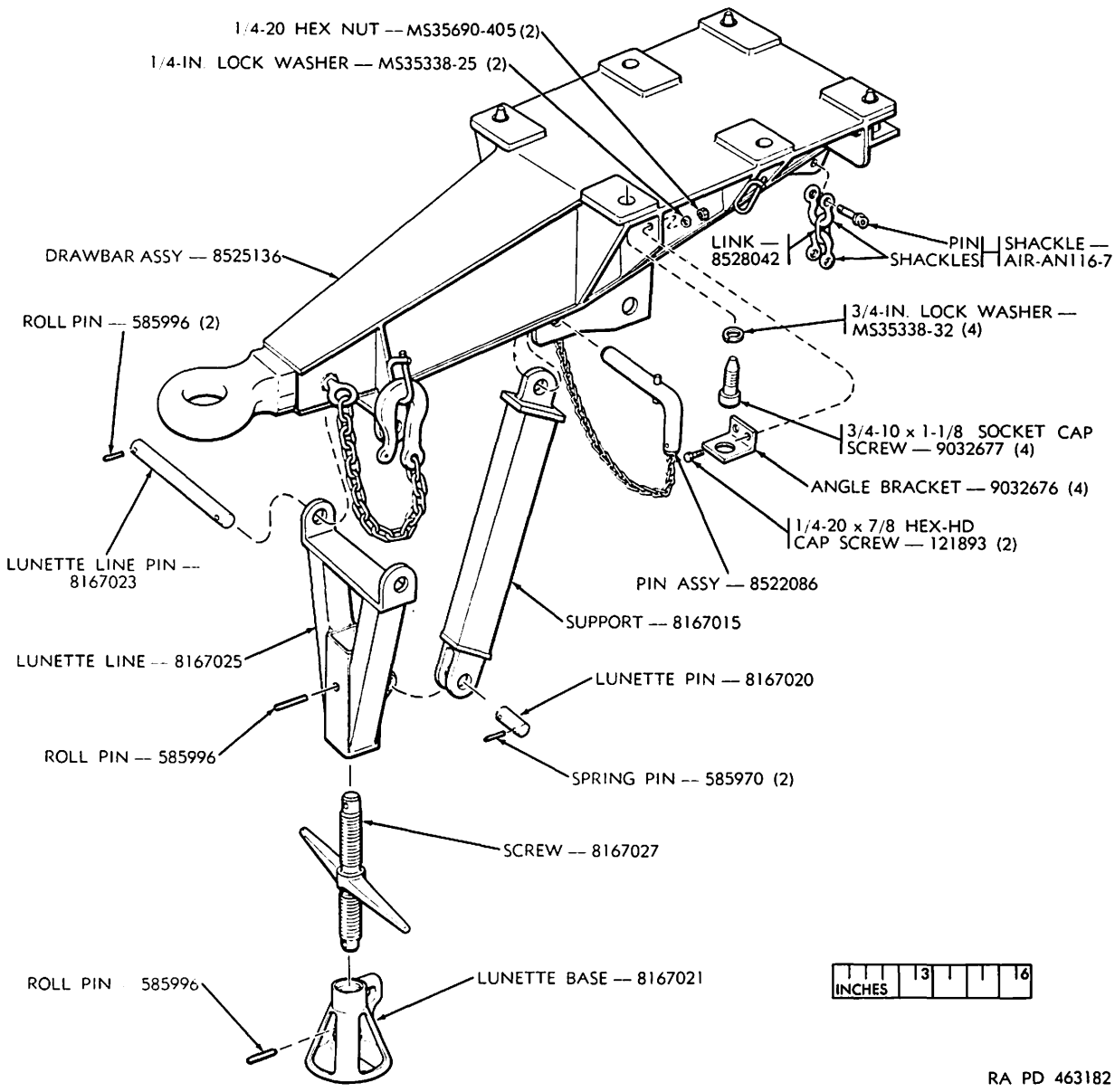


Figure 253. Retractable support assembly — disassembly and assembly.

149. Quick-Release Pin (fig. 254)

a. Removal.

(1) Remove wire rope securing pin to drawbar yoke.

(2) Remove pin from yoke.

b. Installation.

(1) Install pin in drawbar yoke.

(2) Attach wire rope to pin and to yoke with swaging sleeves.

150. Bracket and Brace (fig. 255)

a. Removal.

(1) Remove brace from bracket.

(2) Remove bracket.

b. Installation.

(1) Install bracket.

(2) Install brace on bracket.

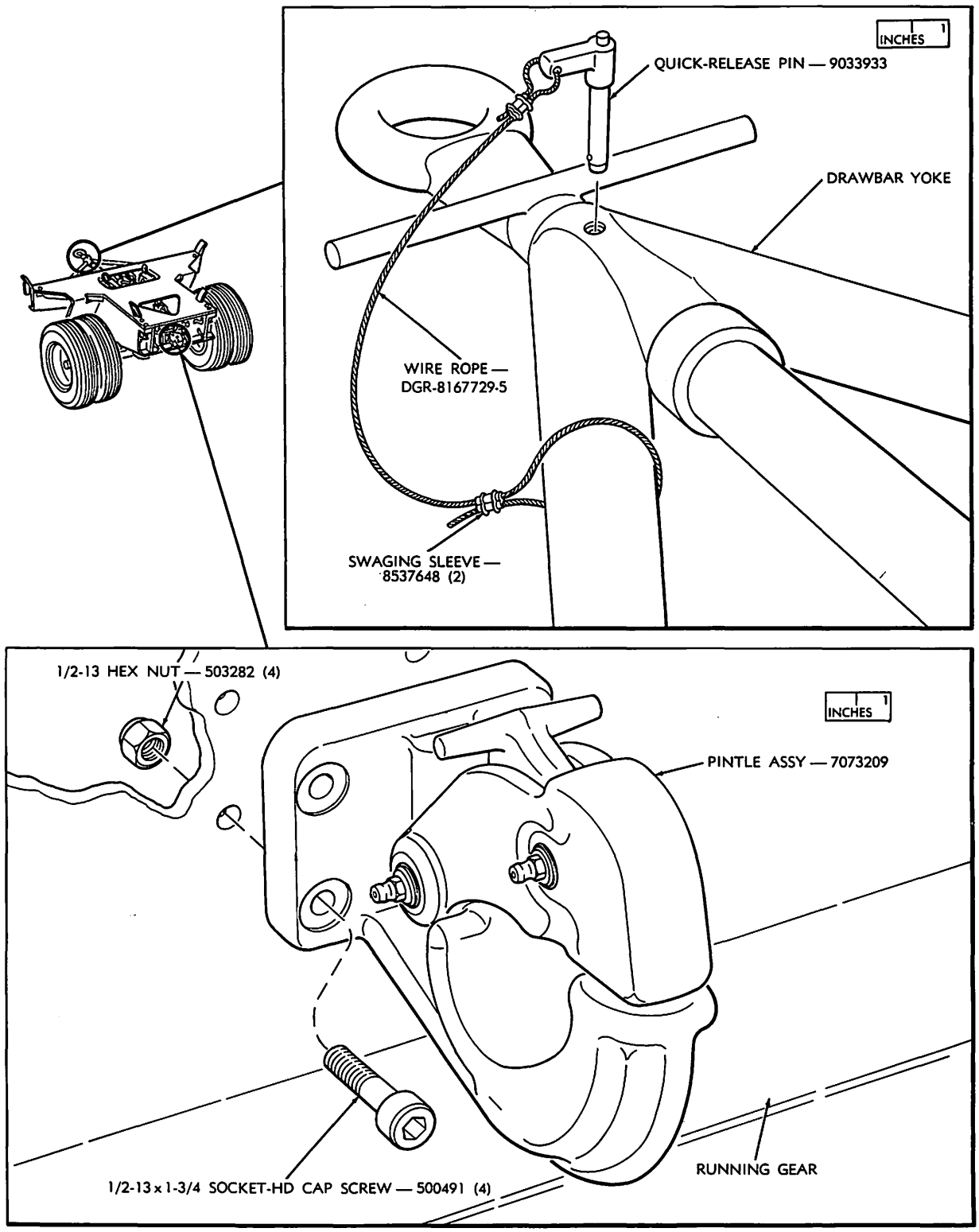
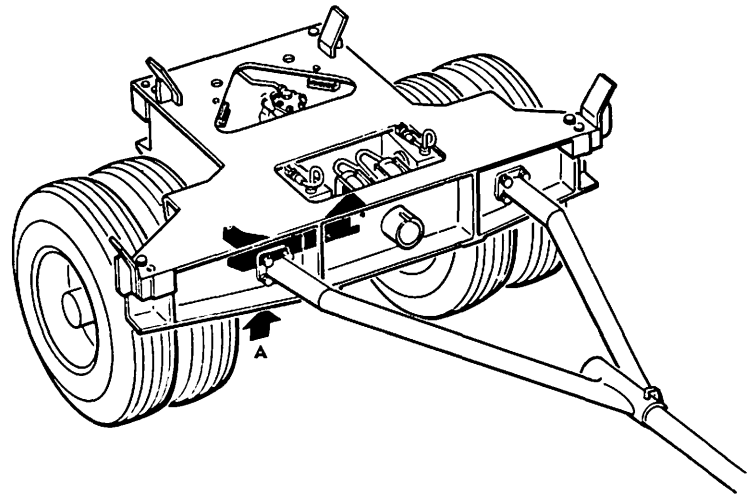


Figure 254. Pintle assembly and quick-release pin – removal and installation.



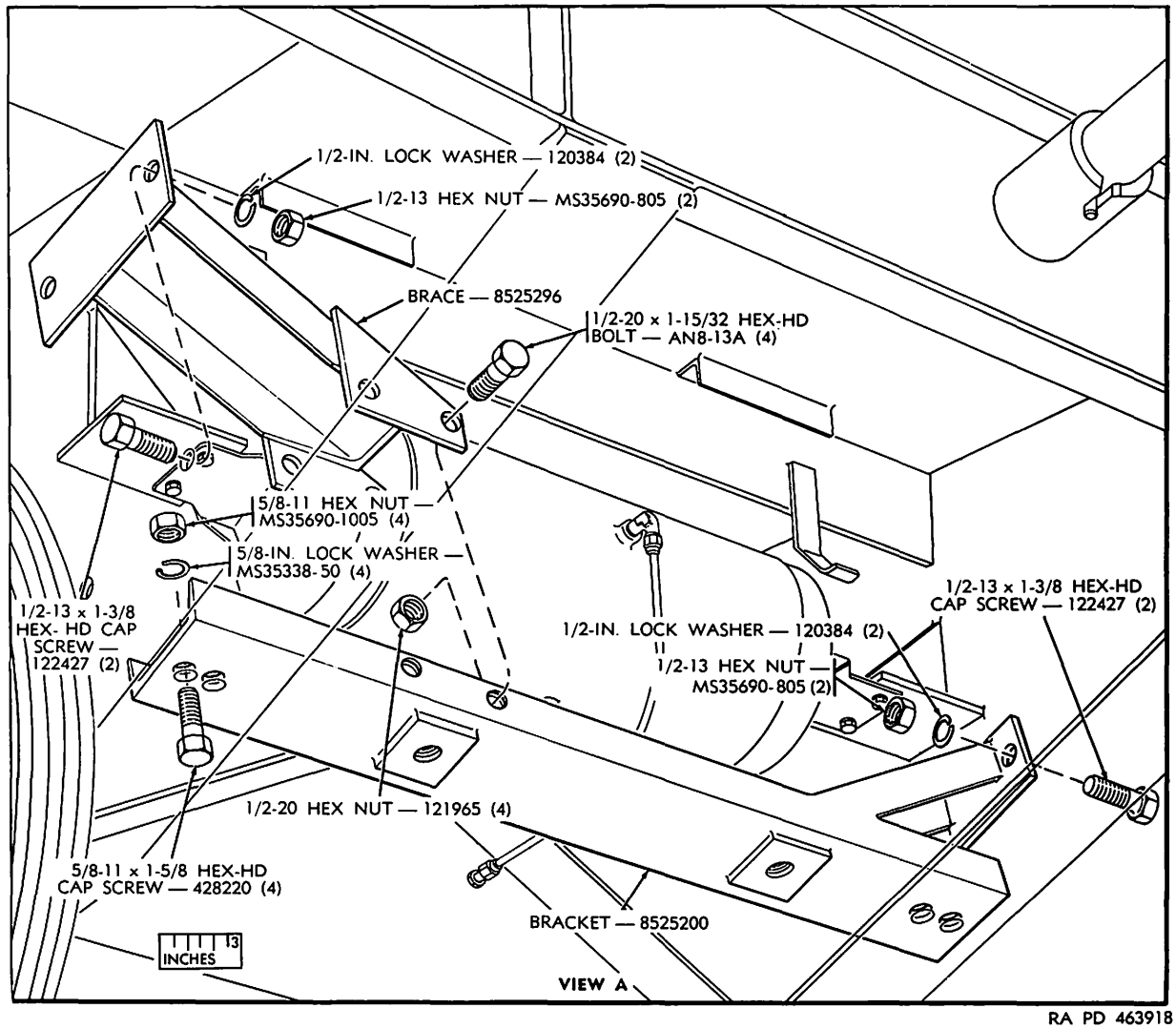


Figure 255. Bracket and brace – removal and installation.

151. Cap Screws (K, fig. 256)

a. Removal.

(1) Remove cap screw retainer (V, fig. 256).

(2) Remove cap screw (K, fig. 256) and lockwasher (J, fig. 256).

b. Installation.

(1) Install 1-8 x 4½ cap screw (K, fig. 256) and 1-inch lockwasher (J, fig. 256).

(2) Install cap screw retainer (V, fig. 256).

152. Screw Shaft (D, fig. 256)

a. Removal.

(1) Remove retaining ring (C, fig. 256).

(2) Remove screw shaft (D, fig. 256).

b. Installation.

(1) Install screw shaft (D, fig. 256).

(2) Install retaining ring (C, fig. 256).

153. Dummy Coupling (M, fig. 256)

a. Removal.

(1) Disconnect hose assembly (R, fig. 256) from dummy coupling (M, fig. 256).

(2) Remove dummy coupling (M, fig. 256).

b. Installation.

(1) Install dummy coupling (M, fig. 256).

(2) Connect hose assembly (R, fig. 256) to dummy coupling (M, fig. 256).

154. Anchor Coupling Assembly (F, fig. 256)

Note. The key letters shown in parentheses in *a* and *b* below refer to figure 256.

a. Removal.

(1) Depressurize air tank assembly (fig. 258) by opening the plug cock assembly.

(2) Remove tube assembly (B).

(3) Remove adapter (E) from anchor coupling assembly (F).

(4) Remove hose assembly (R) and fitting (S) from coupling assembly (F).

(5) Remove anchor coupling assembly (F).

b. Installation.

(1) Install anchor coupling assembly (F) with ¾-inch lockwasher (G).

(2) Install hose assembly (R), fitting (S), and adapter (E) in anchor coupling assembly (F).

(3) Install tube assembly (B) and torque coupling nuts to 500 pound-inches.

(4) Connect an external source of dry air or nitrogen to plug cock assembly (fig. 258).

(5) Open plug cock assembly and pressurize tank assembly to 125 psi.

(6) Close plug cock assembly and disconnect external pressure source.

155. Handbrake Handle (fig. 257)

Warning: **To avoid possible injury resulting from running gear rolling after handbrake handle is released, make certain running gear is on a level surface.**

a. Removal.

(1) Move handbrake handle to UNLOCK position.

(2) Turn knurled end of handbrake handle counter-clockwise until cable assembly is slack.

(3) Remove pin and disconnect cable assembly from handbrake handle.

(4) Remove handbrake handle.

b. Installation.

(1) Install handbrake handle.

(2) Connect cable assembly to handbrake handle.

(3) Turn knurled end of handbrake handle clockwise until cable assembly is tight.

(4) Move handbrake handle to LOCK position.

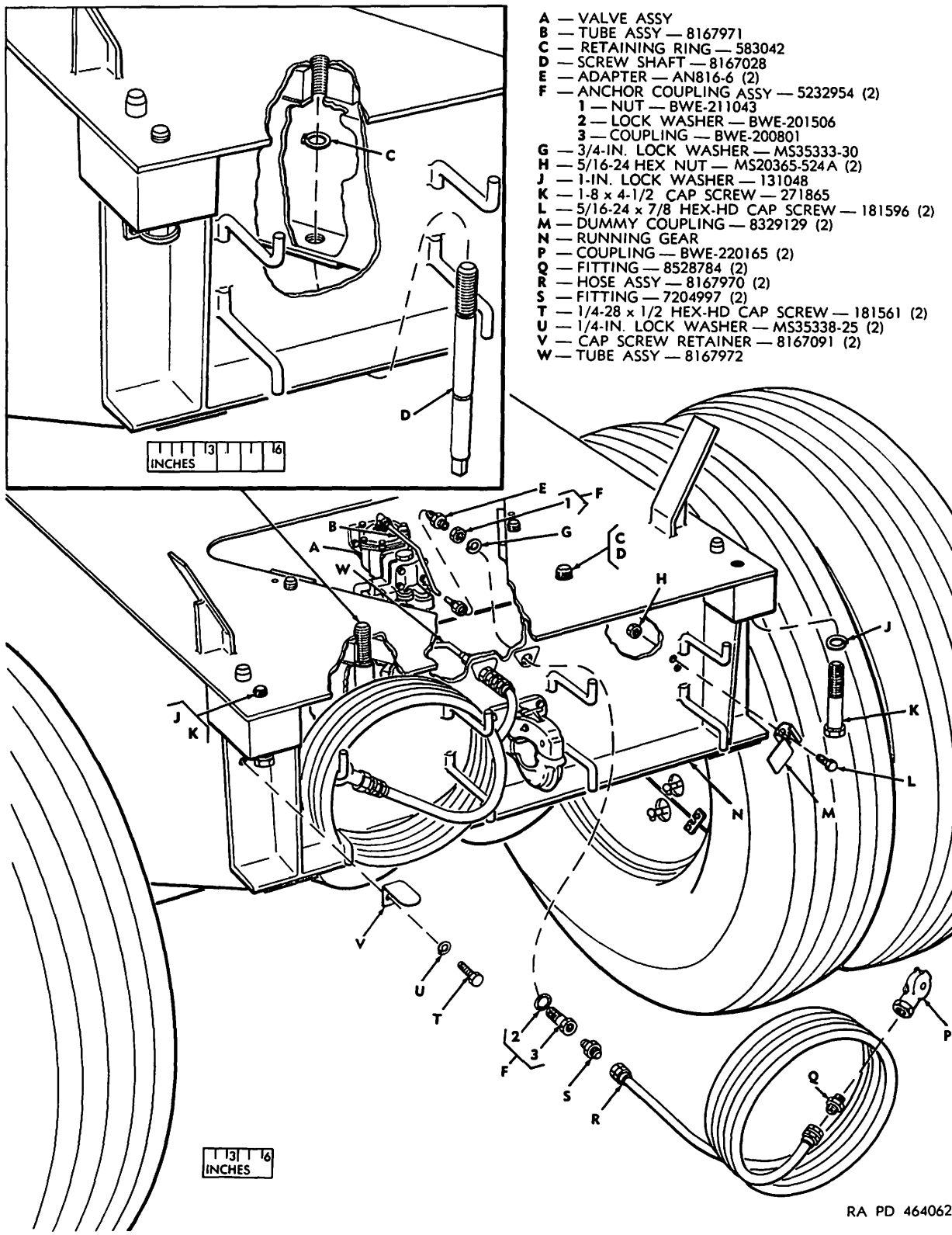


Figure 256. Anchor coupling, dummy coupling, cap screw, and screw shaft – removal and installation – typical.

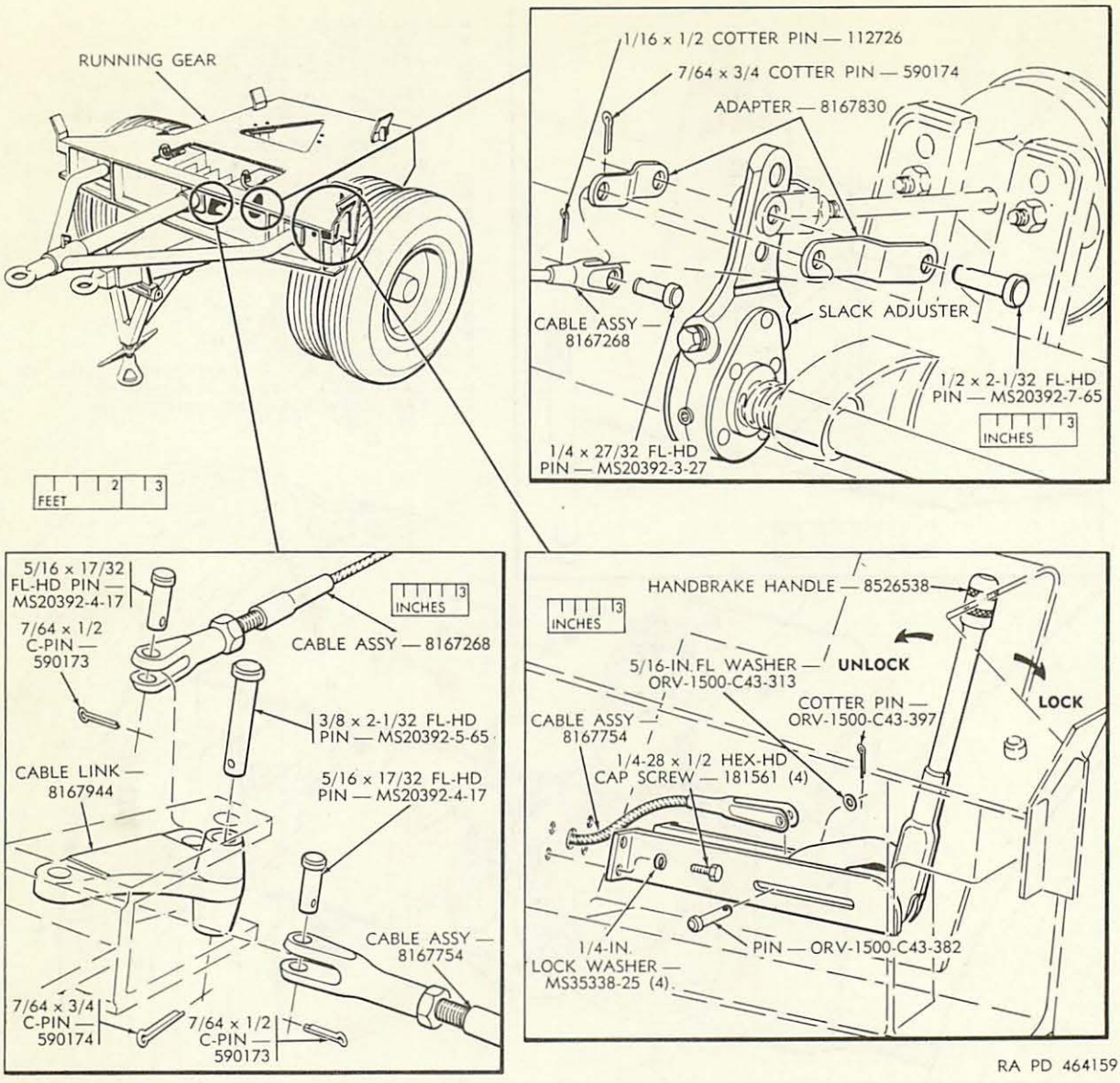


Figure 257. Handbrake handle, adapter, and cable assemblies — removal and installation — typical.

156. Cable Assemblies (fig. 257)

Warning: **To avoid possible injury resulting from running gear rolling after handbrake handle is released, make certain running gear is on a level surface.**

a. Removal.

(1) Move handbrake handle to UNLOCK position.

(2) Turn knurled end of handbrake handle counter-clockwise until cable assembly is slack.

(3) Remove pins and remove cable assembly as required.

b. Installation.

(1) Position and install cable assemblies with pins as required.

(2) Turn knurled end of handbrake handle clockwise until cable assembly is tight.

(3) Move handbrake handle to LOCK position.

157. Cable Link (fig. 257)

Warning: **To avoid possible injury resulting from running gear rolling after handbrake handle is released, make certain running gear is on a level surface.**

a. Removal.

(1) Move handbrake handle to UNLOCK position.

(2) Turn knurled end of handbrake counter-clockwise until cable assembly is slack.

(3) Disconnect the two cable assemblies from cable link.

(4) Remove cable link.

b. Installation.

(1) Install cable link.

(2) Connect the two cable assemblies to link.

(3) Turn knurled end of handbrake handle clockwise until cable assembly is tight.

(4) Move handbrake handle to LOCK position.

158. Adapter (fig. 257)

Warning: **To avoid possible injury resulting from running gear rolling after handbrake handle is released, make certain running gear is on a level surface.**

a. Removal.

(1) Move handbrake handle to UNLOCK position.

(2) Turn knurled end of handbrake handle counter-clockwise until cable assembly is slack.

(3) Disconnect cable assembly from adapter.

(4) Remove adapter from slack adjuster.

b. Installation.

(1) Install adapter on slack adjuster.

(2) Connect cable assembly to adapter.

(3) Turn knurled end of handbrake handle clockwise until cable assembly is tight.

(4) Move handbrake handle to LOCK position.

159. Air Tank Assembly

a. Removal.

(1) Remove the stop light-taillight (fig. 245) and lamp assembly from cavity at front of the running gear.

(2) Remove the launcher-to-prime mover cable assembly (fig. 252).

(3) Remove the retractable support assembly from running gear as described in paragraph 147*a*.

(4) Remove bracket (fig. 255) and brace.

(5) Depressurize air tank assembly (fig. 258) by opening plug cock assembly.

(6) Remove tube assembly and elbow.

(7) Remove plug cock assembly.

(8) Remove air tank assembly.

b. Installation.

(1) Install tank assembly and plug cock assembly.

(2) Install elbow and tube assembly. Torque coupling nuts to 300 pound-inches.

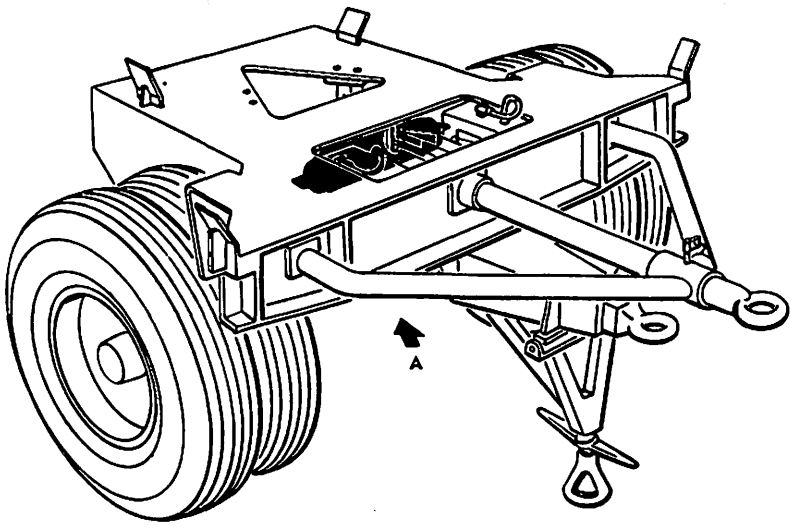
(3) Connect an external source of dry air or nitrogen to plug cock assembly.

(4) Open plug cock assembly and pressurize tank assembly to 125 psi.

(5) Close plug cock assembly and disconnect external pressure source.

(6) Install bracket (fig. 255) and brace.

(7) Install retractable support assembly (fig. 252) on running gear as described in paragraph 147*e*.



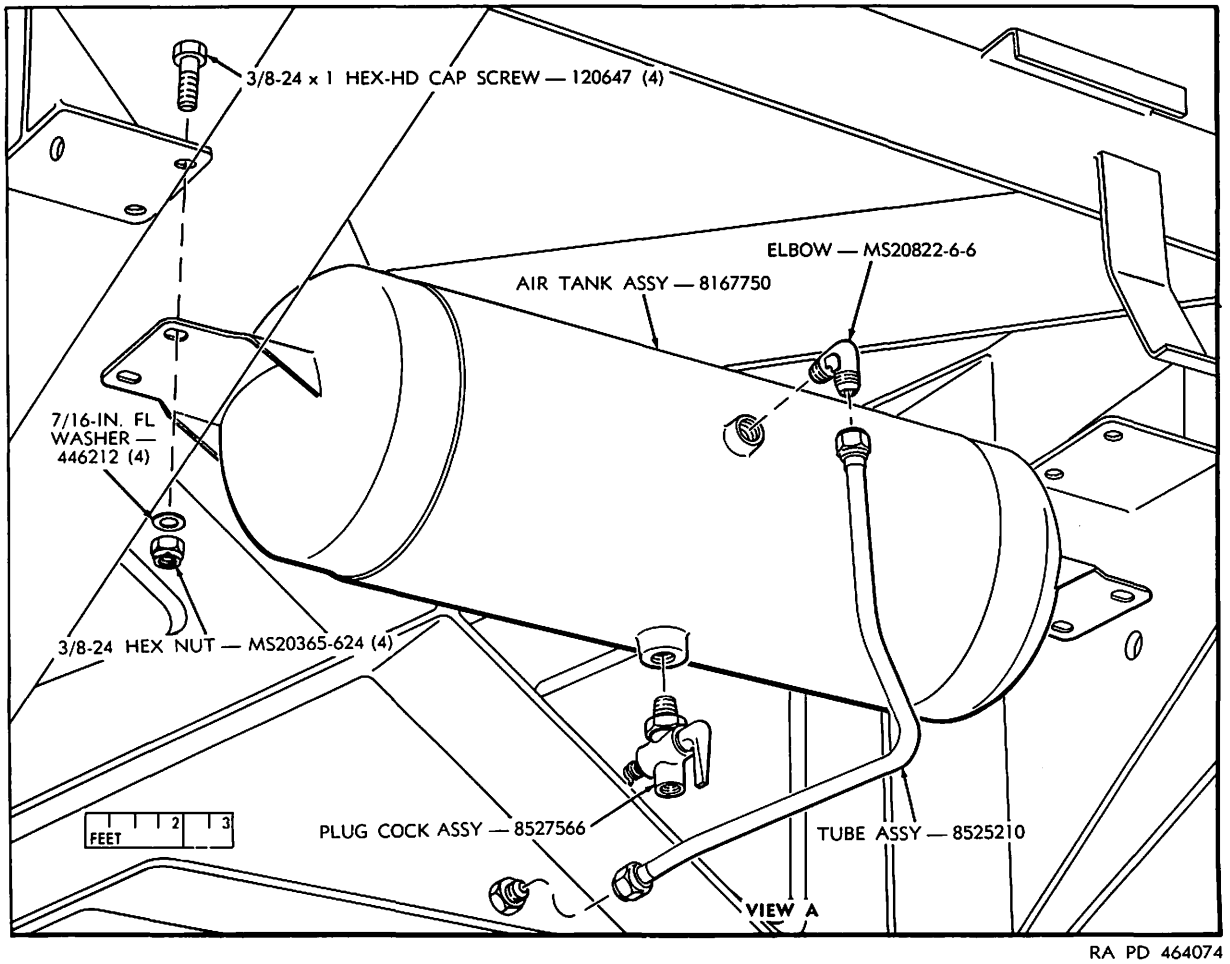


Figure 258. Air tank assembly – removal and installation.

(8) Stow the launcher-to-prime mover cable assembly (fig. 252) in running gear.

(9) Stow stop light-taillight (fig. 245) and lamp assembly in cavity at front of running gear.

160. Plug Cock Assembly

a. Removal (fig. 258).

(1) Depressurize air tank assembly by opening plug cock assembly.

(2) Remove plug cock assembly.

b. Installation.

(1) Install plug cock assembly.

(2) Connect an external source of dry air or nitrogen to plug cock assembly.

(3) Open plug cock assembly and pressurize tank assembly to 125 psi.

(4) Close plug cock assembly and disconnect external pressure source.

161. Valve Group

a. Removal.

(1) Depressurize air tank assembly (fig. 258) by opening plug cock assembly.

(2) Disconnect tube assemblies (fig. 259) and reducer assemblies.

(3) Remove valve group.

b. Disassembly. Disassemble valve group.

c. Assembly. Assemble valve group.

d. Installation.

(1) Install valve group.

(2) Connect reducer assemblies and tube assemblies; torque coupling nuts to 300 pound-inches.

(3) Connect an external source of dry air or nitrogen to plug cock assembly (fig. 258).

(4) Open plug cock assembly and pressurize tank assembly to 125 psi.

(5) Close plug cock assembly and disconnect external pressure source.

162. Wheel Group

a. Removal.

(1) Place handbrake handle (fig. 257) to LOCK.

(2) Position automotive jack (fig. 260) and raise running gear until tires of wheel group are off ground.

(3) Remove wheel groups as required.

b. Disassembly.

(1) Deflate tire.

(2) Disassemble wheel group.

c. Assembly.

(1) Assemble wheel group.

(2) Lay wheel group flat on ground with side ring next to ground.

***Warning:* Make certain wheel group is in this position before inflating tire. The ground will protect personnel from possible serious injury if the ring springs loose when the tire is inflated in the following step.**

(3) Inflate tire to 80 psi.

d. Installation.

(1) Install both wheel groups.

(2) Lower running gear and remove automotive jack.

163. Wheel Hub Group

a. Removal (fig. 261).

(1) Remove two wheel groups as described in paragraph 162*a*.

(2) Remove grease cap and fiber gasket.

(3) Remove wheel hub group.

b. Disassembly.

(1) Remove grease ring.

(2) Remove packing retainer.

(3) Remove inside cone and rollers.

(4) Remove inside tapered roller bearing cup.

(5) Remove outside cone and rollers.

(6) Remove outside tapered roller bearing cup.

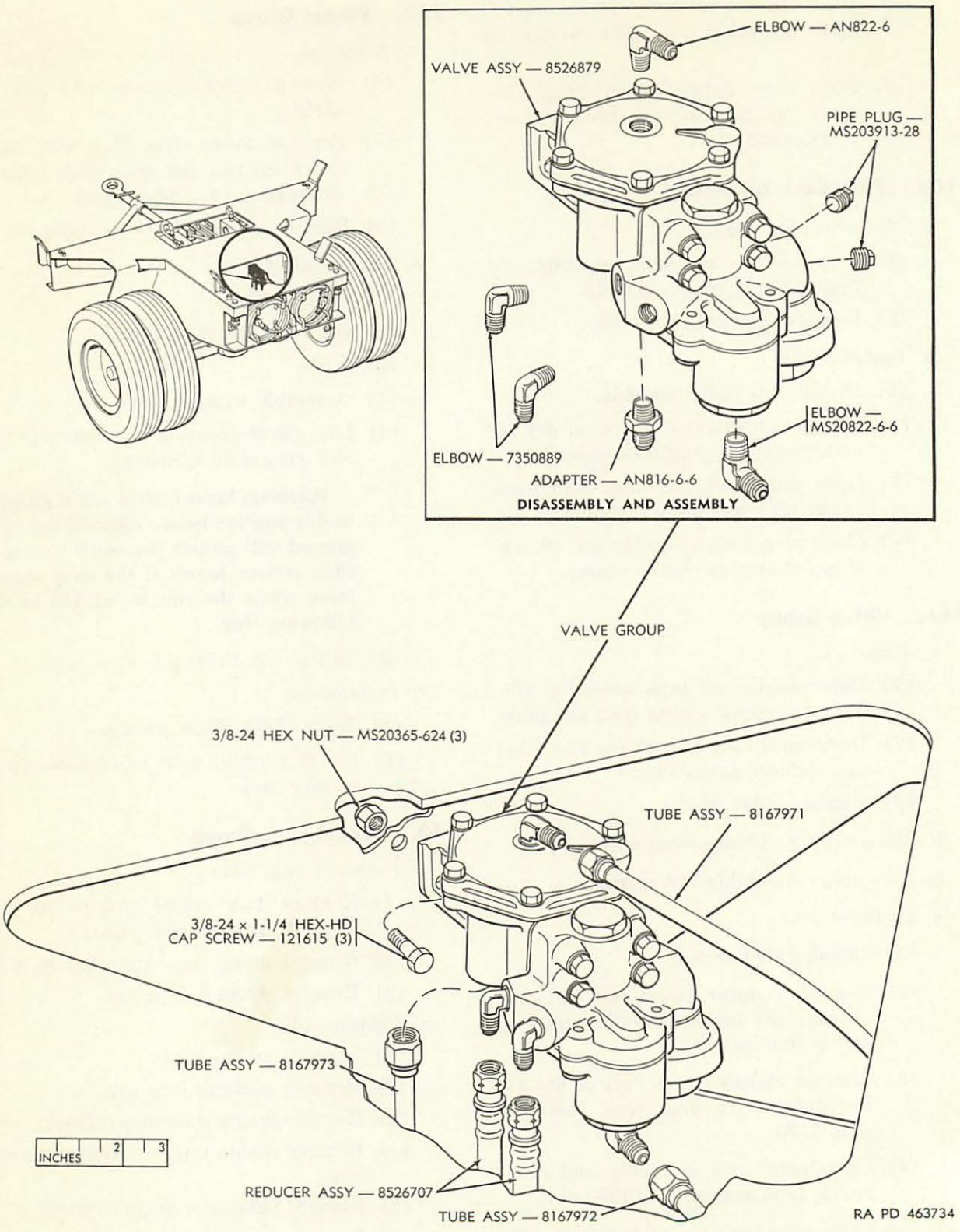


Figure 259. Valve group – removal and installation.

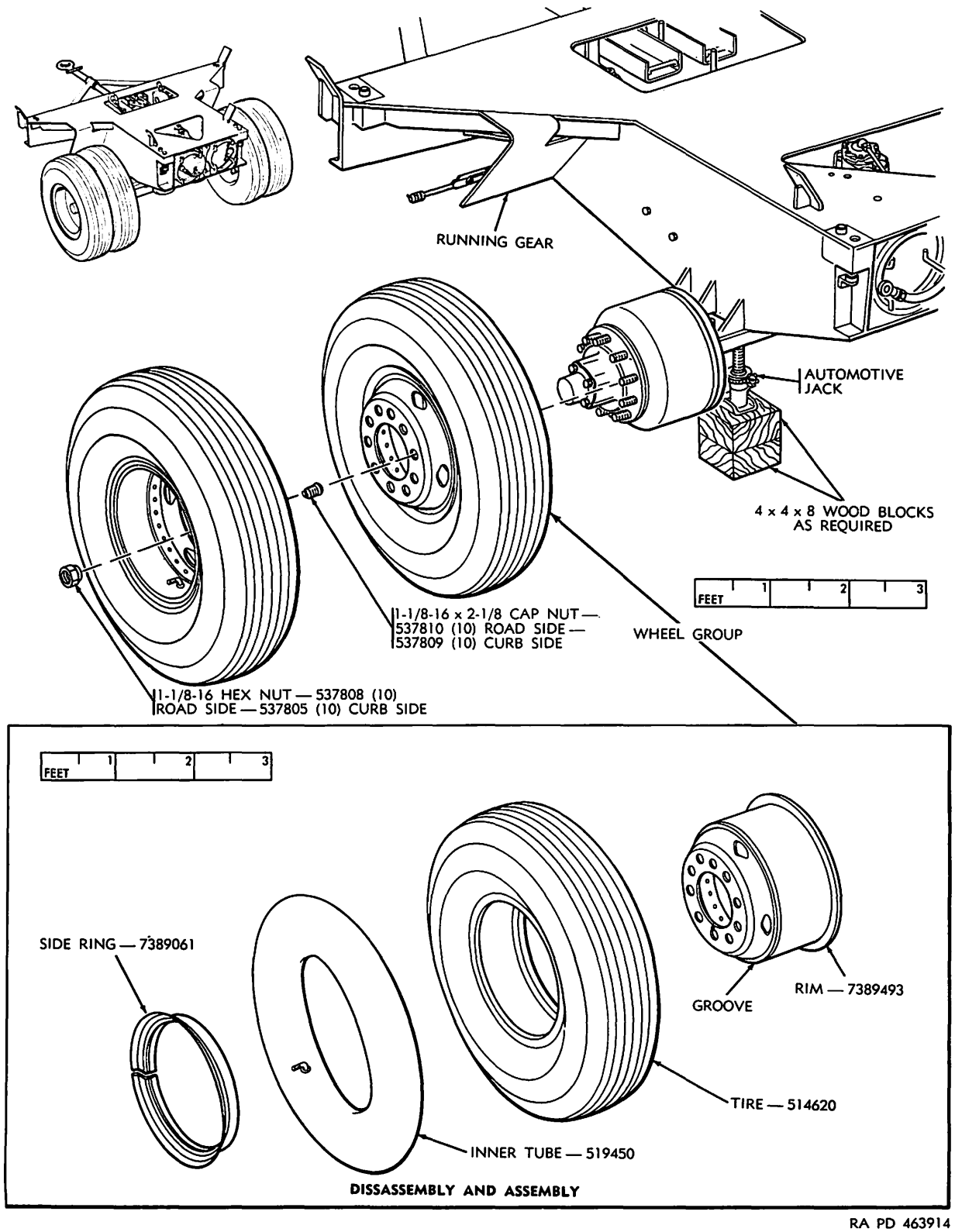


Figure 260. Wheel group – removal and installation – typical.

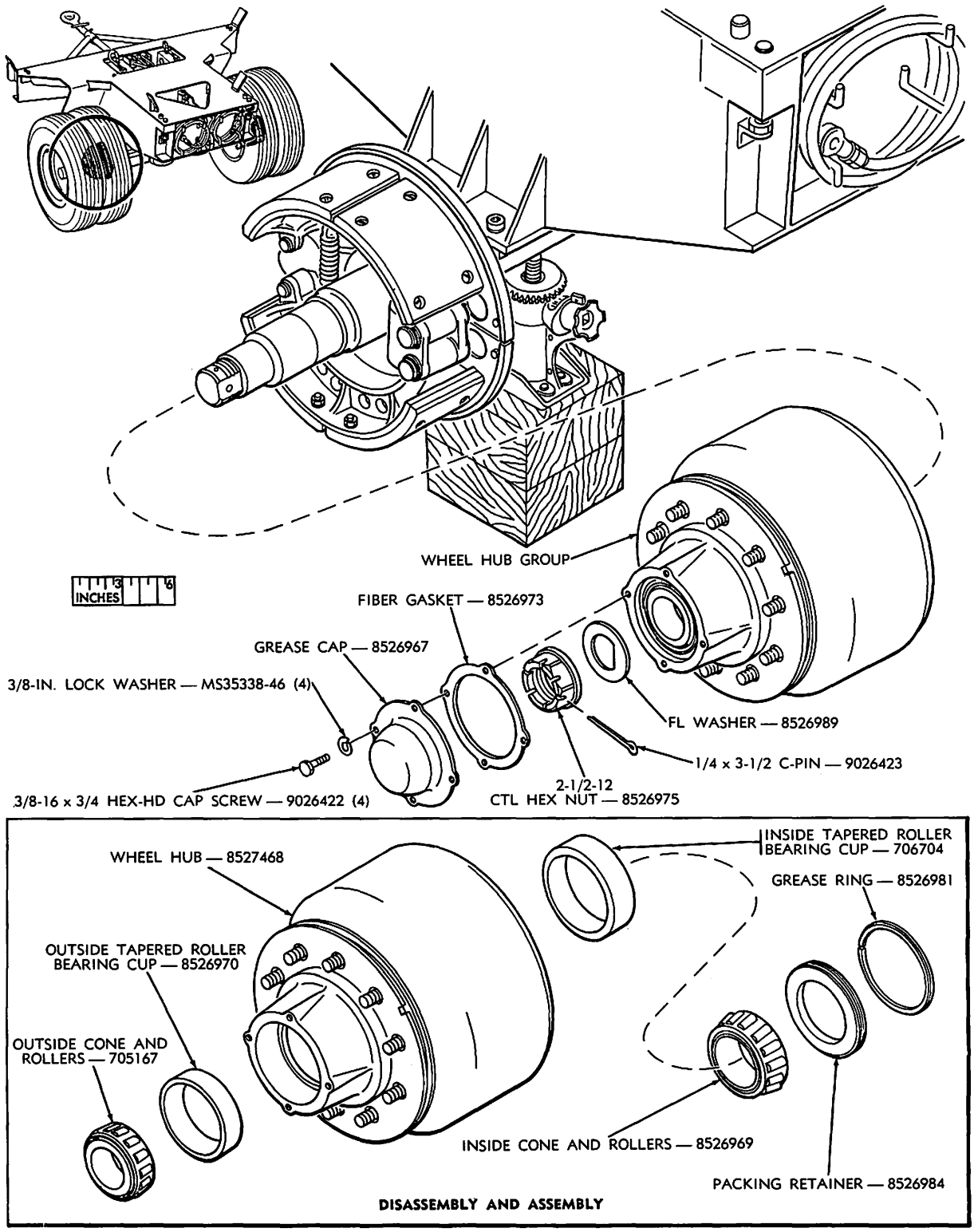


Figure 261. Wheel hub group – removal and installation – typical.

c. Assembly.

(1) Install outside tapered roller bearing cup.

(2) Install outside cone and rollers.

(3) Install inside tapered roller bearing cup.

(4) Install inside cone and rollers.

(5) Lubricate as described in TM 9-1440-250-20.

(6) Install packing retainer.

(7) Install grease ring.

d. Installation.

(1) Install wheel hub group.

(2) Install grease cap and fiber gasket.

(3) Install two wheel groups (fig. 260) as described in paragraph 162*d*.

164. Sleeve Bearings and Sleeve Bearing Pins (fig. 262)

a. Removal.

(1) Remove two wheel groups as described in paragraph 162*a*.

(2) Remove wheel hub group as described in paragraph 163*a*.

(3) Remove brakeshoe spring (fig. 262).

(4) Remove dust shields.

(5) Remove sleeve bearings and sleeve bearing pins.

b. Installation.

(1) Install sleeve bearings and sleeve bearing pins.

(2) Install brakeshoe spring and dust shields.

(3) Install wheel hub group as described in paragraph 163*d*.

(4) Install wheel groups as described in paragraph 162*e*.

165. Camshaft Bushings (fig. 262)

a. Removal.

(1) Remove two wheel groups as described in paragraph 162*a*.

(2) Remove wheel hub group as described in paragraph 163*a*.

(3) Remove brakeshoe spring and dust shields.

(4) Remove slack adjuster and compression spring.

(5) Remove camshaft.

(6) Remove camshaft bushing.

b. Installation.

(1) Install camshaft bushings.

(2) Install camshaft.

(3) Install slack adjuster and compression spring.

(4) Install brakeshoe spring and dust shields.

(5) Install wheel hub group (fig. 261) as described in paragraph 163*d*.

(6) Install two wheel groups (fig. 260) as described in paragraph 162*d*.

166. Dust Shield Assembly (fig. 262)

a. Removal.

(1) Diconnect dust shield assembly by removing two hexagon-head cap screws.

(2) Remove two mending plates.

(3) Remove two dust shields.

b. Installation.

(1) Place two dust shields on axle and install mending plates.

(2) Install dust shield assembly.

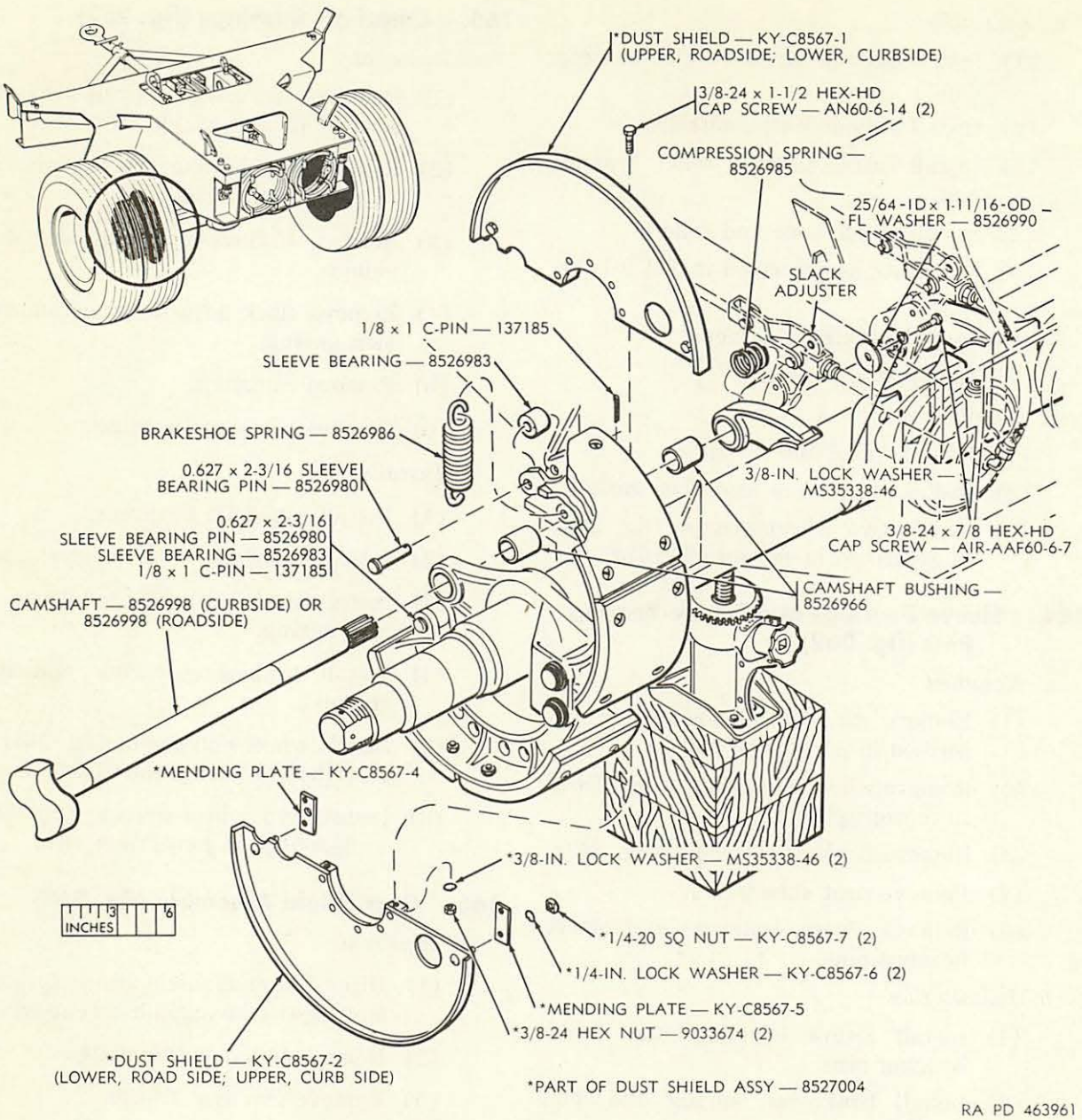


Figure 262. Brakeshoe camshaft bushings, sleeve bearings, and dust shield assembly – removal and installation – typical.

CHAPTER 9

MAINTENANCE OF LAUNCHER SUB-SURFACE FOUR-RACK MODIFICATION KIT

Section I. GENERAL

167. Scope

This chapter contains maintenance information covering the launcher sub-surface four-rack modification kit, that is within the scope of field maintenance personnel. The scope of field maintenance is determined by the listing of field maintenance parts in TM 9-1440-250-35P/1 and the listing of special tools for field maintenance personnel in the Department of the Army Supply Manual 9-4-4935-J29-4.

168. References

Organizational maintenance of the launcher sub-surface four-rack modification kit is covered in TM 9-1440-250-20. Schematic diagrams are furnished in TM 9-1440-251-20, and wiring diagrams are provided in TM 9-1440-250-35. General maintenance procedures are provided in TM 9-1400-250-30. Additional general maintenance procedures applicable to performing maintenance on the launcher sub-surface four-rack modification kit are provided in chapter 4. It is especially important that personnel become familiar with the contents of chapter 4 and TM 9-1400-250-35. No references to general maintenance procedures are provided in this chapter.

169. General Precautions

When performing any maintenance on the hydraulic or electrical systems of the launcher sub-surface four-rack modification kit, the precautions described in *a* and *b* below must be observed.

a. Hydraulic Precautions.

***Warning:* Hydraulic fluid is flammable. Precautions should be taken to prevent spillage. Fire protection measures should be employed.**

(1) Make certain the launchers No. 2 and No. 3 globe valves (fig. 63) and launchers No. 2 and No. 3 MISSILE HYDRAULIC SHUT-OFF valves are closed.

(2) Cap all open lines to prevent contamination of the system.

b. Electrical Precautions.

(1) Set the main power switch on power distribution box to OFF.

(2) Shut down launching section generator.

(3) Disconnect cable assemblies from receptacles J6A, J69B, and J69C on front of power distribution box.

(4) Place launching section generator in operation if power is required for other equipment.

Section II. MAINTENANCE OF LAUNCHER SUB-SURFACE FOUR-RACK MODIFICATION KIT HYDRAULIC SYSTEM

170. General

This section provides the procedures for performing maintenance on the hydraulic system of the launcher sub-surface four-rack modification kit. The maintenance procedures provided describe the removal, disassembly, assembly, and installation of the clamps, valve assemblies, and fittings of the hydraulic network. The precautions described in paragraph 169*a* must be observed when performing any maintenance on these items.

171. Loading Rack Clamp Assembly

There are 19 loading rack clamp assemblies (D, fig. 263). They are located on the side trusses of the loading racks to support the hydraulic lines and the electrical cable assemblies. The procedures described in *a* through *d* below are typical for the removal, disassembly, assembly, and installation of the loading rack clamp assemblies.

Note. The key letters shown in parentheses in *a* and *d* below refer to figure 263.

a. Removal.

(1) Make certain the launchers No. 2 and No. 3 globe valves (fig. 63) and launchers No. 2 and No. 3 MISSILE HYDRAULIC SHUT-OFF valves are closed.

(2) Place a container underneath loading rack clamp assembly (D) to be removed, to catch hydraulic fluid that drains from lines.

(3) Loosen clevis assemblies (D2) and release retainer assemblies (D3 and D4).

(4) Loosen wing nut (D1) and remove clamp assembly (D).

b. Disassembly (fig. 264). Disassemble clamp assembly.

c. Assembly.

(1) Install two rod end clevises.

(2) Install two retainer assemblies.

Note. Retainer assemblies and clevises must be free to rotate after assembly.

d. Installation.

(1) Install clamp assembly (D).

(2) Secure retainer assembly (D3).

(3) Install hydraulic lines, torque coupling nuts to 300 pound-inches, and secure retainer assembly (D4).

(4) Perform hydraulic test station air bleed procedures as described in paragraph 43.

172. Loading Rack Clamp Assembly

There are six loading rack clamp assemblies (B, fig. 263). They are located on the side trusses of the loading racks to support the hydraulic lines and the electrical cable assemblies. The procedures described in *a* through *d* below are typical for the removal, disassembly, assembly, and installation of the loading rack clamp assemblies.

Note. The key letters shown in parentheses in *a* and *b* below refer to figure 263.

a. Removal.

(1) Make certain the launchers No. 2 and No. 3 globe valves (fig. 63) and launchers No. 2 and No. 3 MISSILE HYDRAULIC SHUT-OFF valves are closed.

(2) Place a container underneath loading rack clamp assembly (B) to be removed, to catch hydraulic fluid that drains from lines.

(3) Loosen clevis assembly (B2) and release retainer assembly (B3).

(4) Disconnect tube assemblies as required and remove tube elbows (C); cap all open lines.

(5) Release clevis assembly (B2).

(6) Loosen wing nut (B1) and remove clamp assembly (B).

b. Disassembly (fig. 264). Disassemble clamp assembly.

c. Assembly.

(1) Install rod end clevis.

(2) Install retainer assembly.

Note. Retainer assembly and clevis must be free to rotate after assembly.

d. Installation.

(1) Install loading rack clamp assembly (B).

(2) Secure retainer assembly (B3).

(3) Install tube elbows (C), connect tube assemblies, and torque coupling nuts to 300 pound-inches.

(4) Perform hydraulic test station air bleed procedures as described in paragraph 43.

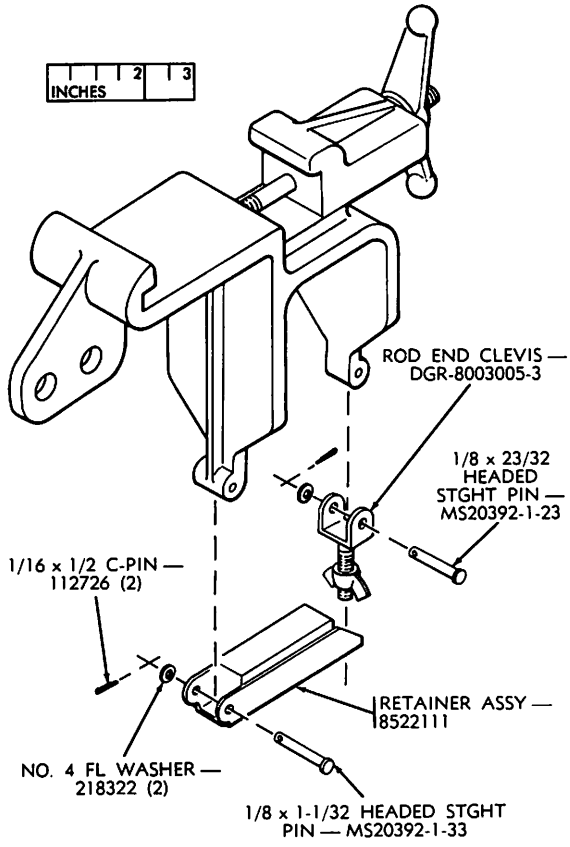


Figure 264. Loading rack clamp assemblies — disassembly and assembly.

173. Loading Rack Support Clamp Assembly

There are two loading rack support clamp assemblies (figs. 265 and 266) installed to support the hydraulic lines. The procedures described in *a* through *d* below are typical for the removal, disassembly, assembly, and installation of the support clamp assemblies.

a. Removal.

(1) Make certain the launchers No. 2 and No. 3 globe valves (fig. 63) and launchers No. 2 and No. 3 MISSILE HYDRAULIC SHUT-OFF valves are closed.

(2) Place a container underneath support clamp assembly to be removed, to catch hydraulic fluid that drains from lines.

(3) Disconnect and remove tube assemblies; cap all open lines.

(4) Remove support clamp assembly.

b. Disassembly. Disassemble support clamp assembly.

c. Assembly. Assemble support clamp assembly.

d. Installation.

(1) Position and secure support clamp assembly.

(2) Connect the tube assemblies and torque coupling nuts to 300 pound-inches.

(3) Perform the launcher hydraulic system air bleed procedure as described in paragraph 43.

174. Globe Valve

There is one globe valve (fig. 266) located in the trench by the wall on the left and one globe valve in the trench by the wall on the right.

a. Removal.

(1) Make certain the launchers No. 2 and No. 3 globe valves (fig. 63 and launchers No. 2 and No. 3 MISSILE HYDRAULIC SHUT-OFF valves are closed.

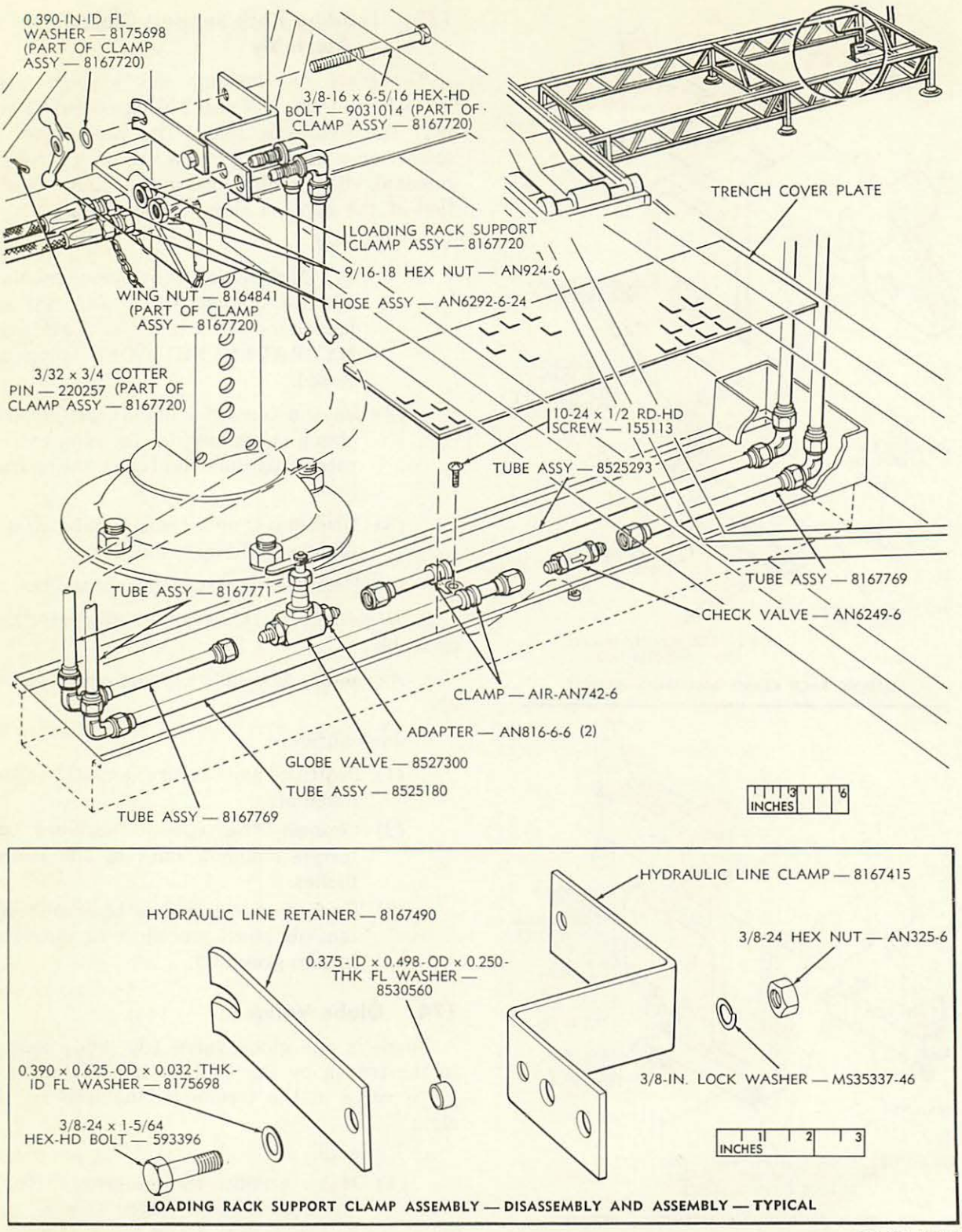


Figure 265. Loading rack support clamp assembly, globe valve, and check valve – right side – removal and installation.

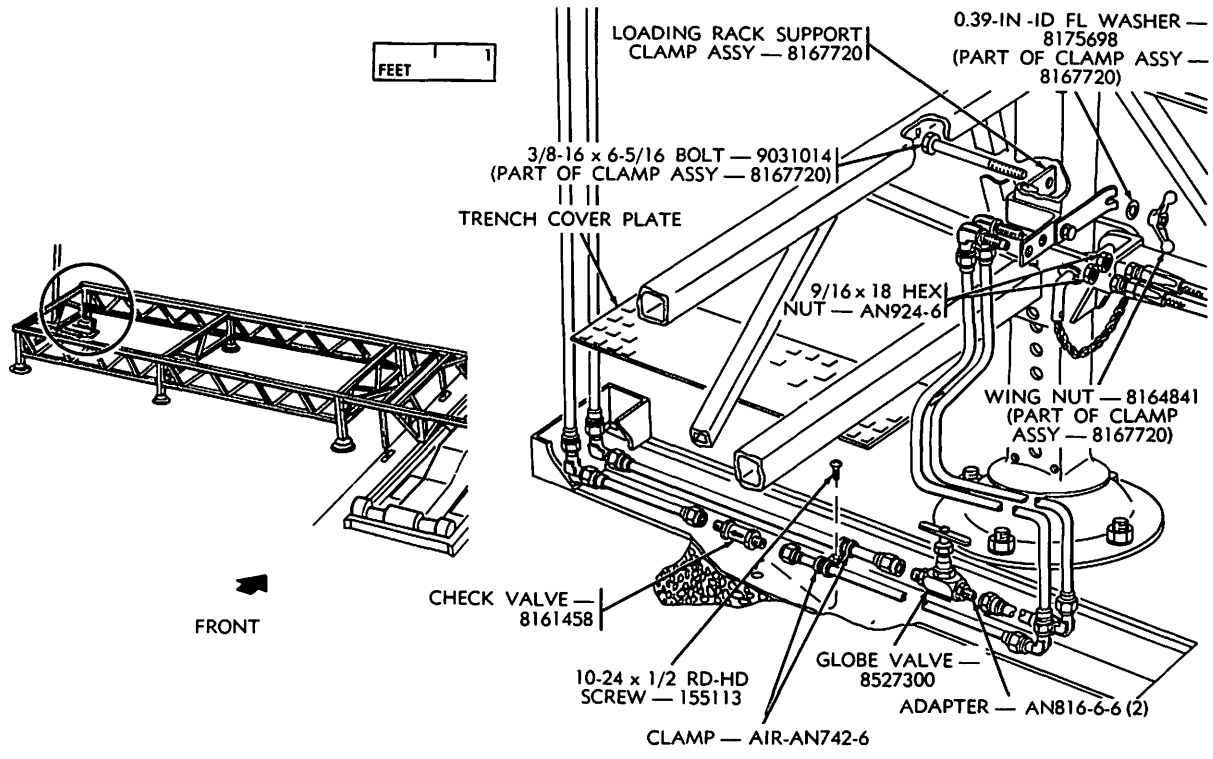


Figure 266. Loading rack support clamp assembly, globe valve, and check valve – left side – removal and installation.

(2) Remove round-head screw to loosen the clamps that secure hydraulic lines.

(3) Remove tube assemblies and cap open lines.

(4) Remove globe valve with adapters.

b. Installation.

(1) Position globe valve with adapters and connect tube assemblies. Torque coupling nuts of tube assemblies to 300 pound-inches.

(2) Install clamps.

(3) Perform hydraulic test station air bleed procedures as described in paragraph 43.

175. Check Valve

There is one check valve (fig. 266) in the trench by the wall on the left, and one check valve (fig. 265) in the trench by the wall on the right of the underground storage chamber. The check valves are installed in the hydraulic return lines.

a. Removal.

(1) Make certain the launchers No. 2 and No. 3 globe valves (fig. 63) and launchers No. 2 and No. 3 MISSILE HYDRAULIC SHUT-OFF valves are closed.

(2) Remove screw to loosen the clamps that secure the hydraulic lines to the floor (figs. 265 and 266).

(3) Remove tube assemblies and cap open lines.

b. Installation.

(1) Install tube assemblies and check valve; torque coupling nuts of tube assemblies to 300 pound-inches.

Note. Check valve must be positioned in hydraulic return line so that flow indicating arrow is pointing toward nearest sidewall.

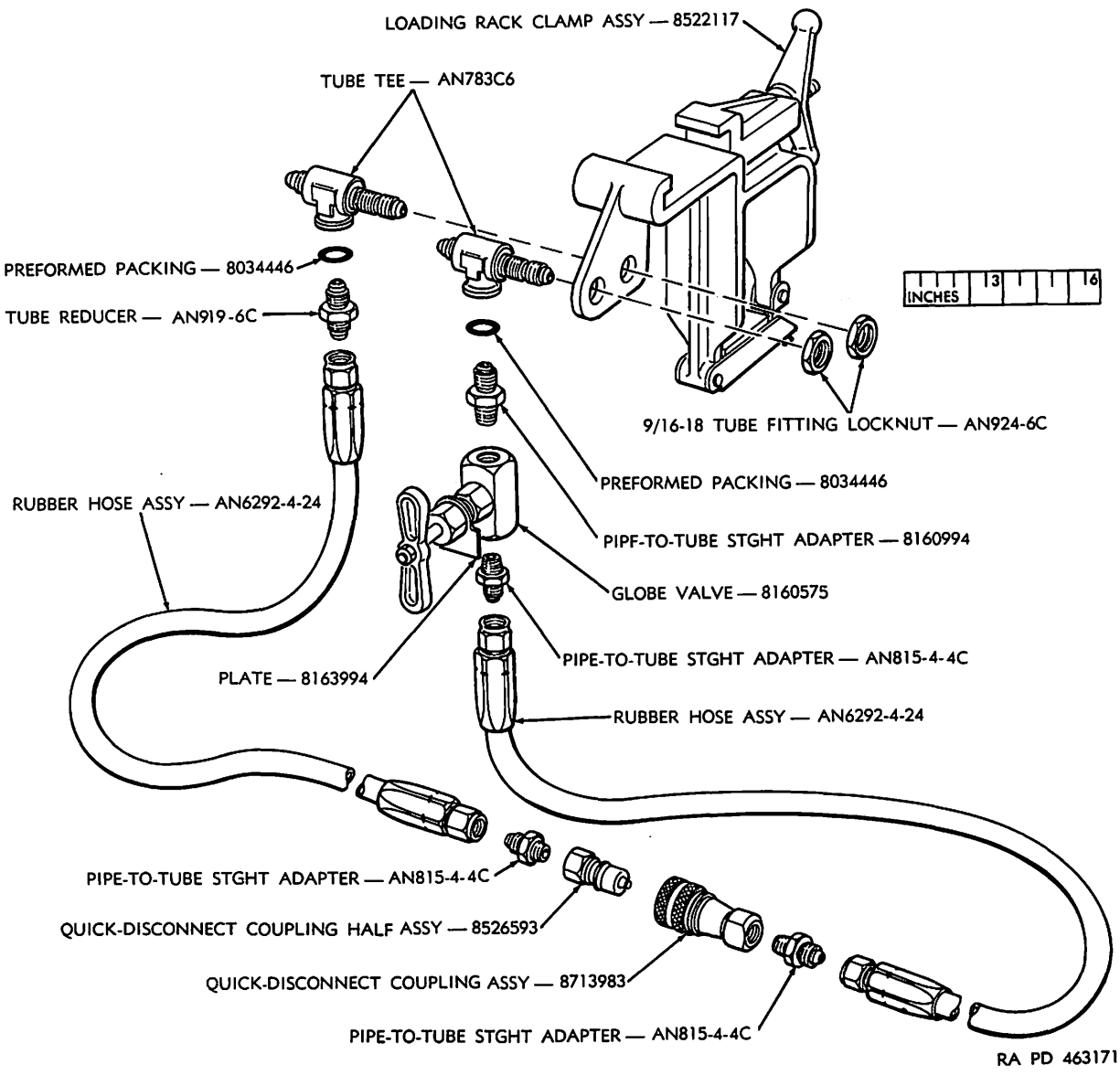


Figure 267. Test station valve assembly – partial disassembly and assembly.

(2) Install clamps.

(3) Perform hydraulic test station air bleed procedures as described in paragraph 43.

176. Test Station Valve Assembly

There are nine test station valve assemblies (J, fig. 263) located in the underground storage chamber. These nine valve assemblies are located at test stations as shown on figure 63. Each valve assembly (fig. 267) consists of a globe valve, two tube tees, two rubber hose assemblies joined at one end by a quick-disconnect coupling assembly, and a loading rack clamp assembly to install the valve assembly. The procedures described in *a* through *d* below are typical for the removal, disassembly, assembly, and installation of a test station valve assembly.

Note. The key letters shown in parentheses in *a* and *b* below refer to figure 263.

a. Removal.

(1) Make certain the launchers No. 2 and No. 3 globe valves (fig. 63) and launchers No. 2 and No. 3 MISSILE HYDRAULIC SHUT-OFF valves are closed.

(2) Place a container underneath test station valve assembly to be removed, to catch hydraulic fluid that drips from lines.

(3) Disconnect and cap the hydraulic lines and remove tube caps (H) as required.

(4) Loosen clevis (B2) and release retainer assembly (B3).

(5) Release electrical cable assemblies.

(6) Loosen wing nut (B1) and remove valve assembly (J).

b. Disassembly (fig. 267).

(1) Remove rubber hose assemblies and cap open couplings.

(2) Disassemble remaining parts of valve assembly.

c. Assembly.

(1) Position and secure tube tees on loading rack clamp assembly.

(2) Install globe valve.

(3) Install rubber hose assemblies and all remaining parts.

d. Installation.

(1) Position valve assembly (J) and install by securing wing nut (B1).

(2) Connect attaching tube assemblies and torque coupling nuts to 300 pound-inches.

(3) Secure retainer assembly (B3).

(4) Perform hydraulic test station air bleed procedures as described in paragraph 43.

177. Flange and Flange Cover Plate

The removal and installation of the flange and flange cover plate (E, fig. 263) is described in *a* and *b* below.

Note. The key letters shown in parentheses in *a* and *b* below refer to figure 263, unless otherwise indicated.

a. Removal.

(1) Make certain the launchers No. 2 and No. 3 globe valves (fig. 63) and launchers No. 2 and No. 3 MISSILE HYDRAULIC SHUT-OFF valves are closed.

(2) Hold a container underneath rubber hose assemblies (H, fig. 268) to catch hydraulic fluid that drips from lines. Disconnect hose assemblies. Cap all open lines.

(3) Disconnect tube assemblies from tube nipples (E1) on the flange cover plate (E3).

(4) Remove flange cover plate (E3) from flange (E5) and remove tube nipples (E1).

b. Installation.

(1) Install tube nipples (E1) on flange cover plate (E3).

(2) Install flange (E5) on conduit (E8).

(3) Connect tube assemblies in conduit to nipples (E1) and torque coupling nuts to 300 pound-inches.

(4) Install plate (E3) on flange (E5).

(5) Connect tube assemblies in the conduit to hose assemblies (H, fig. 268) and torque coupling nuts to 300 pound-inches.

(6) Perform hydraulic test station air bleed procedures as described in paragraph 43.

178. Hydraulic Network Miscellaneous Attaching Components

Note. The key letters shown in parentheses in this paragraph refer to figure 268, unless otherwise indicated.

Clamps (F) and expansion shields (M) are used to secure the tube assemblies (C) to the side walls in the underground storage chamber, and underneath Hercules monorail launcher assembly No. 4 (H, fig. 269).

a. Clamp. Removal and installation of clamps is described in (1) and (2) below.

(1) *Removal.* Remove clamps (F) and (G2, fig. 263) as required.

(2) *Installation.* Install clamps as required.

Note. Expansion shields are replaced only when damaged or when too loose to offer firm support of tube assemblies (C). Refer to *b* below for replacement of shields.

b. Expansion Shield.

(1) *Removal.*

(*a*) Remove clamps (G2, fig. 263) or (F).

(*b*) Remove plate (G8, fig. 263) or retaining strap (J).

(*c*) Remove expansion shield (G5, fig. 263) or (E or M).

(*d*) Remove bolt (G4, fig. 263) or (L).

(2) *Installation of expansion shield (E).*

(*a*) Drill a ⅜-inch diameter x ⅝-inch deep hole in masonry at least two inches from existing hole and in line with tube assemblies (C).

(*b*) Insert expansion shield in hole, conical end first.

(*c*) Set expansion shield with setting tool.

Note. One setting tool is furnished with each box of expansion shields.

(*d*) Install clamps.

(3) *Installation of expansion shield* (G5, fig. 263) or (M).

(*a*) Drill a 1⅛-inch diameter x 1¾-inch deep hole in masonry at least two inches from existing hole and in line with tube assemblies (C).

(*b*) Place expansion shield on bolt with the conical end against head of bolt.

(*c*) Insert bolt and expansion shield in hole.

(*d*) Set expansion shield with setting tool.

Note. One setting tool is furnished with each box of expansion shields.

(*e*) Install retaining strap (J) or plate (G8, fig. 263), and clamps as required.

179. Hydraulic Network Tube Fittings and Hose Assemblies

The procedures described in *a* and *b* below are typical for the removal and installation of the tube nipples (K, fig. 263 and D, fig. 268) and tube elbows (F, fig. 263 and B, fig. 268) and hose assemblies (H, fig. 268).

a. Removal.

(1) Make certain the launchers No. 2 and No. 3 globe valves (fig. 63) and launchers No. 2 and No. 3 MISSILE HYDRAULIC SHUT-OFF valves are closed.

(2) Place a container underneath tube nipple, tube elbow, or hose assembly to be removed.

(3) Disconnect attaching tube assemblies.

(4) Remove nipple elbow and cap both open lines.

(5) Disconnect and remove hose assembly (H, fig. 268) as required; cap all open lines.

b. Installation.

(1) Install nipple, elbow, or hose assembly; torque coupling nuts to 300 pound-inches.

(2) Perform the launcher hydraulic system air bleed procedure as described in paragraph 43.

Section III. MAINTENANCE OF LAUNCHER SUB-SURFACE FOUR-RACK MODIFICATION KIT ELECTRICAL SYSTEM

180. General

a. This section describes the maintenance of cable assemblies and loudspeakers, and the components and hardware items that support their installation.

b. When replacing any cable assembly (fig. 269) that is routed through a conduit, it may be necessary to remove all of the cable assemblies from the conduit. To facilitate the installation of cable assemblies through a conduit, a pull-through line (fig. 84) is tied to the ends of the cable assemblies being removed. The pull-through line is pulled into the conduit as the cable assemblies are removed. To route cable assemblies through a conduit, tie the pull-through line to the ends of the cable assemblies and pull cable assemblies through the conduit.

b.1. When replacing a cable assembly protected by electrical cable protective covers (H.4, fig. 269), remove the covers that are associated with cable assembly. Insulation tape should not be applied to areas of a cable assembly protected by covers. After cable replacement, covers must be installed.

c. The precautions described in paragraph 169*b* must be observed when performing maintenance on these items.

181. Cable Assemblies — Launcher Control-Indicator No. 1 to HERCULES Monorail Launcher Assembly No. 1

Cable assemblies (D, E, and F, fig. 269) extend from launcher control-indicator No. 1 (P, fig. 269) to the power distribution box and the launcher base of HERCULES monorail launcher assembly No. 1 (B, fig. 269).

***Warning:* Before disconnecting or connecting any external power cables, turn off the section generator. Voltages DANGEROUS TO LIFE are present when the section generator is operating.**

a. Removal.

(1) Turn off section generator.

(2) Raise elevator as described in TM 9-1440-250-12 to facilitate removal of cable assemblies.

(3) Disconnect cable assemblies from receptacle connectors (C, D and E, fig. 270) on launcher control-indicator.

(4) Disconnect cable assemblies from receptacle connectors (C and D, fig. 271) on power distribution box assembly and connector (F of view 1, fig. 271) on launcher base assembly.

(5) Remove wire and insulation tape from these cable assemblies.

(6) Disconnect cable assemblies from mounting boxes (S, fig. 272).

(7) Disconnect cable assemblies (fig. 273) from wall at left of elevator pit.

Note. The warning horn cable, taped to the cable assemblies near the channel, is not replaced at this time.

(8) Remove plastic tape that secures warning horn cable to power cables under launcher and in the channel. Clamp or tape warning horn cable to a platform floor joist (fig. 274) to clear power cables.

(9) Disconnect cable assemblies from platform floor joists.

(10) Remove cable supports (fig. 275) and remove cable assemblies from channel.

(11) Remove cable assemblies from vertical conduits (fig. 276).

b. Installation.

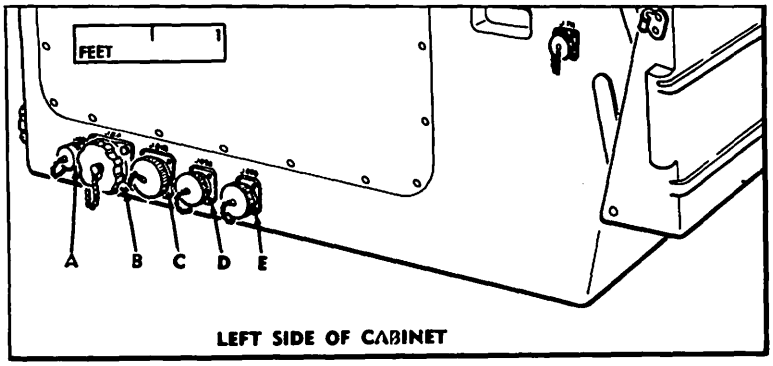
(1) Install cable assemblies in vertical conduits.

(2) Connect cable assemblies temporarily to receptacle connectors (C, D, and E, fig. 270) of launcher control-indicator No. 1 (P, fig. 269).

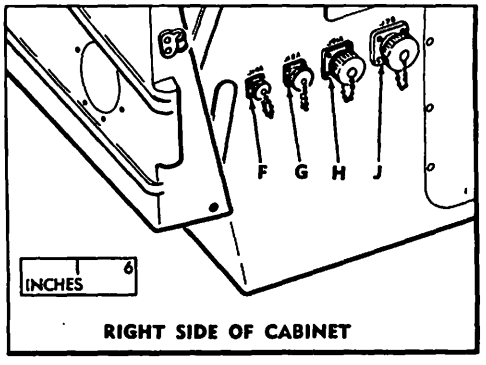
(3) Position and secure cable assemblies (fig. 273) to wall at left of elevator pit.

(4) Disconnect cable assemblies, connected in (2) above, from launcher control-indicator No. 1.

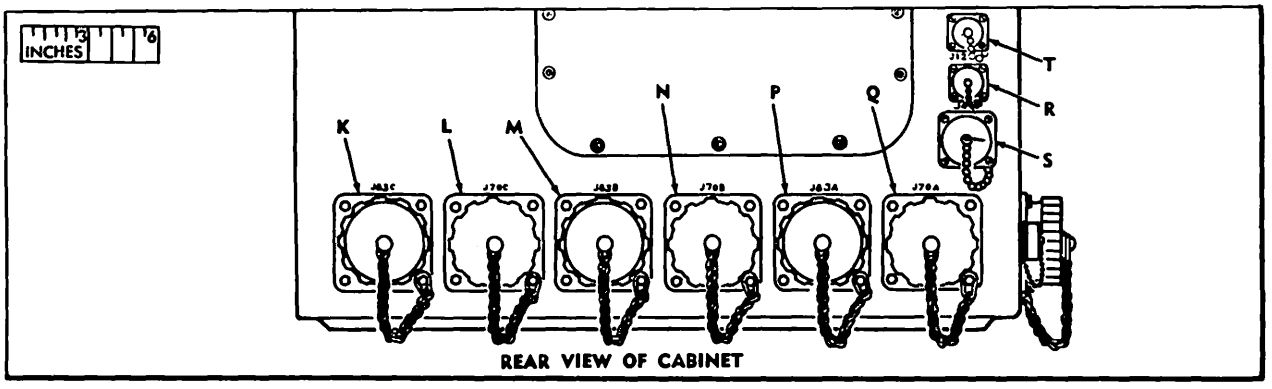
(5) Install opposite end of cable assemblies in mounting boxes (S, fig. 272).



LEFT SIDE OF CABINET



RIGHT SIDE OF CABINET



REAR VIEW OF CABINET

KEY	RECEPTACLE CONNECTOR	CONNECTED TO RECEPTACLE CONNECTOR	ON EQUIPMENT
A	J88A	J90G	LAUNCHING SECTION CONTROL-INDICATOR
B	J5A	J4A	LAUNCHING SECTION CONTROL-INDICATOR
C	J81B	J81A	LAUNCHER BASE (NO. 4)
		J81A	LAUNCHER BASE (NO. 2 AND 3)
		J81A	LAUNCHER BASE (NO. 1)
D	J69A	J69B	POWER DISTRIBUTION BOX (LCHR NO. 4)
		J69B	POWER DISTRIBUTION BOX (LCHR NO. 2 AND 3)
		J69B	POWER DISTRIBUTION BOX (LCHR NO. 1)
E	J69D	J69C	POWER DISTRIBUTION BOX (LCHR NO. 4)
		J69C	POWER DISTRIBUTION BOX (LCHR NO. 2 AND 3)
		J69C	POWER DISTRIBUTION BOX (LCHR NO. 1)
F	J14A		BURST TEST
G	J13A		TEST EQUIPMENT POWER
H	J91A		TELEMETRY
J	J7B		UTILITY POWER
K	J83C		TEST STATION
L	J70C		TEST STATION
M	J83B		TEST STATION
N	J70B		TEST STATION
P	J83A		TEST STATION
Q	J70A		TEST STATION
R	J12B		LOUDSPEAKER
S	J45A		LIFT AND DOOR CONTROL PANEL
T	J123A		WARNING HORN

ORD G61276

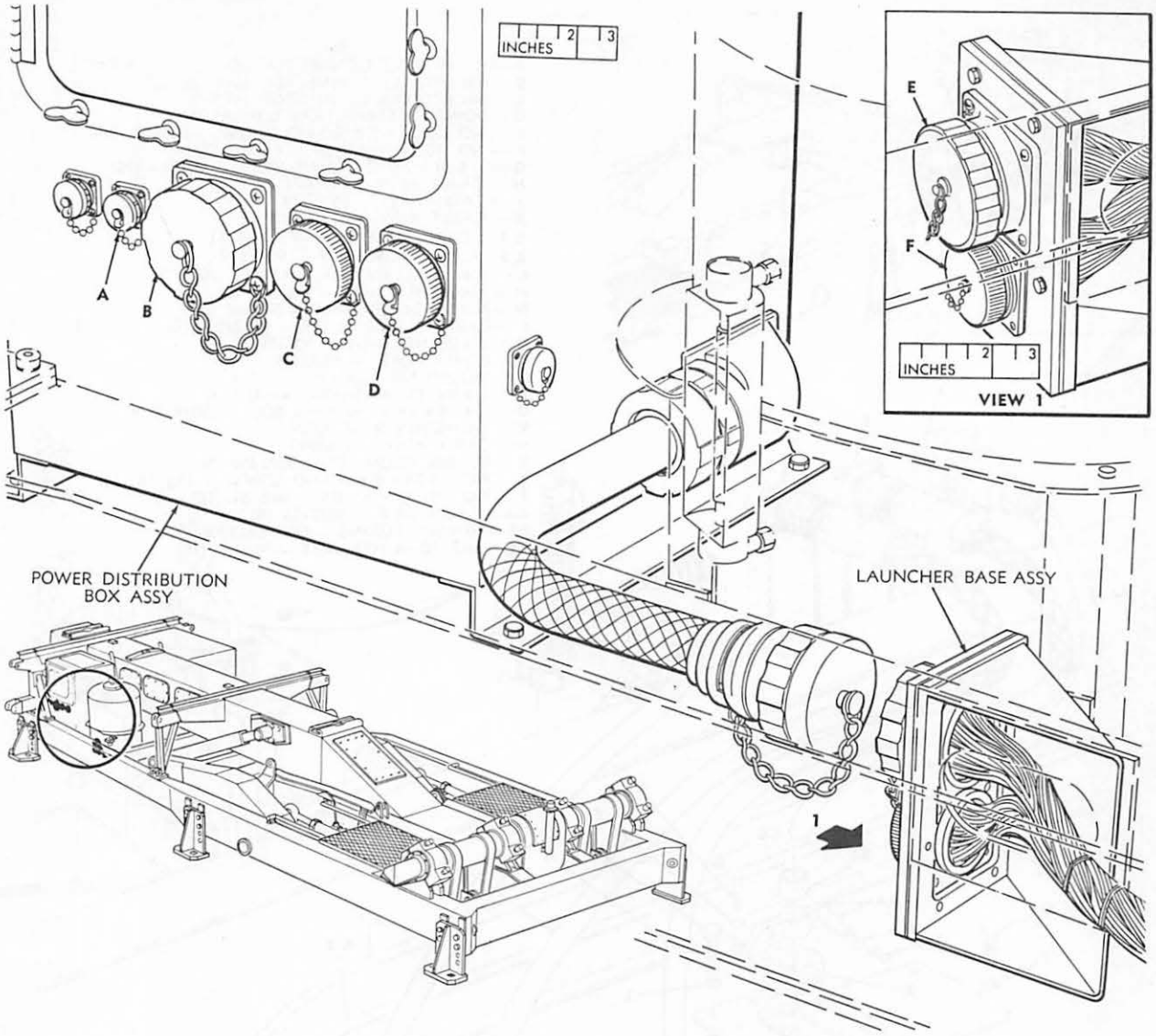
Figure 270. Receptacle connectors of the launcher control-indicator.

(6) Secure cable assemblies in mounting boxes.

(7) Position and secure cable assemblies to platform floor joists (fig. 274) at four places.

(8) Secure warning horn cable, disconnected in *a*(8) above, to cable assemblies with insulation tape.

(9) Position cable assemblies in channel (view A, fig. 275) and hold in place,



KEY	RECEPTACLE CONNECTOR	CONNECTED TO RECEPTACLE CONNECTOR	ON EQUIPMENT
A	J12A	P12A	LOUDSPEAKER
B	J6A	J1	HERCULES SECTION SIMULATOR GROUP
C	J69C	J69D	LAUNCHER CONTROL-INDICATOR NO. 4
		J69D	LAUNCHER CONTROL-INDICATOR NO. 2 & 3
		J69D	LAUNCHER CONTROL-INDICATOR NO. 1
D	J69B	J69A	LAUNCHER CONTROL-INDICATOR NO. 4
		J69A	LAUNCHER CONTROL-INDICATOR NO. 2 & 3
		J69A	LAUNCHER CONTROL-INDICATOR NO. 1
E	J80A	P80A	POWER DISTRIBUTION BOX
F	J81A	J81B	LAUNCHER CONTROL-INDICATOR NO. 4
		J81B	LAUNCHER CONTROL-INDICATOR NO. 2 & 3
		J81B	LAUNCHER CONTROL-INDICATOR NO. 1

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Figure 271. Power distribution box assembly and launcher base assembly – receptacle connectors.

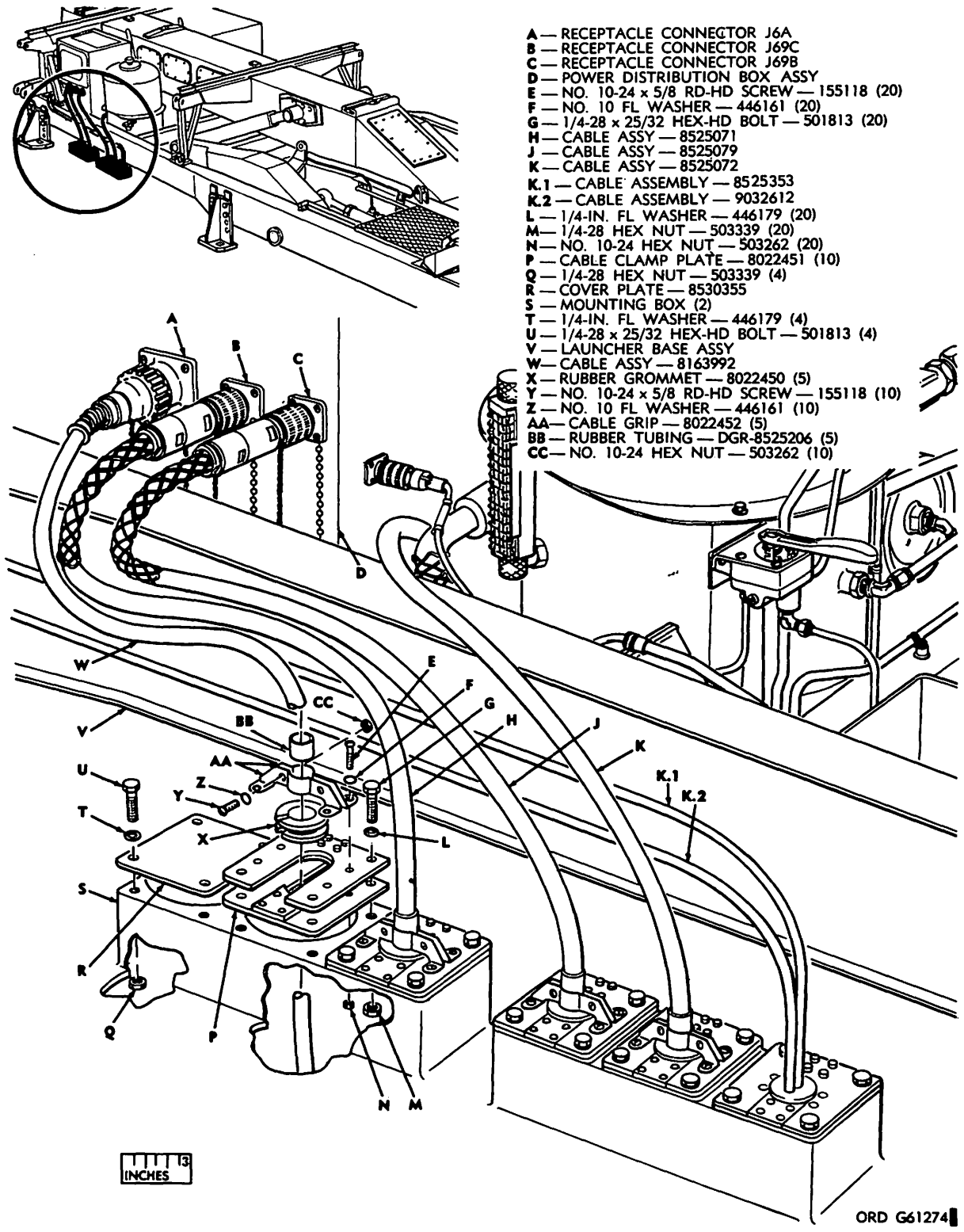


Figure 272. Removal and installation of the cable assemblies through the elevator platform.

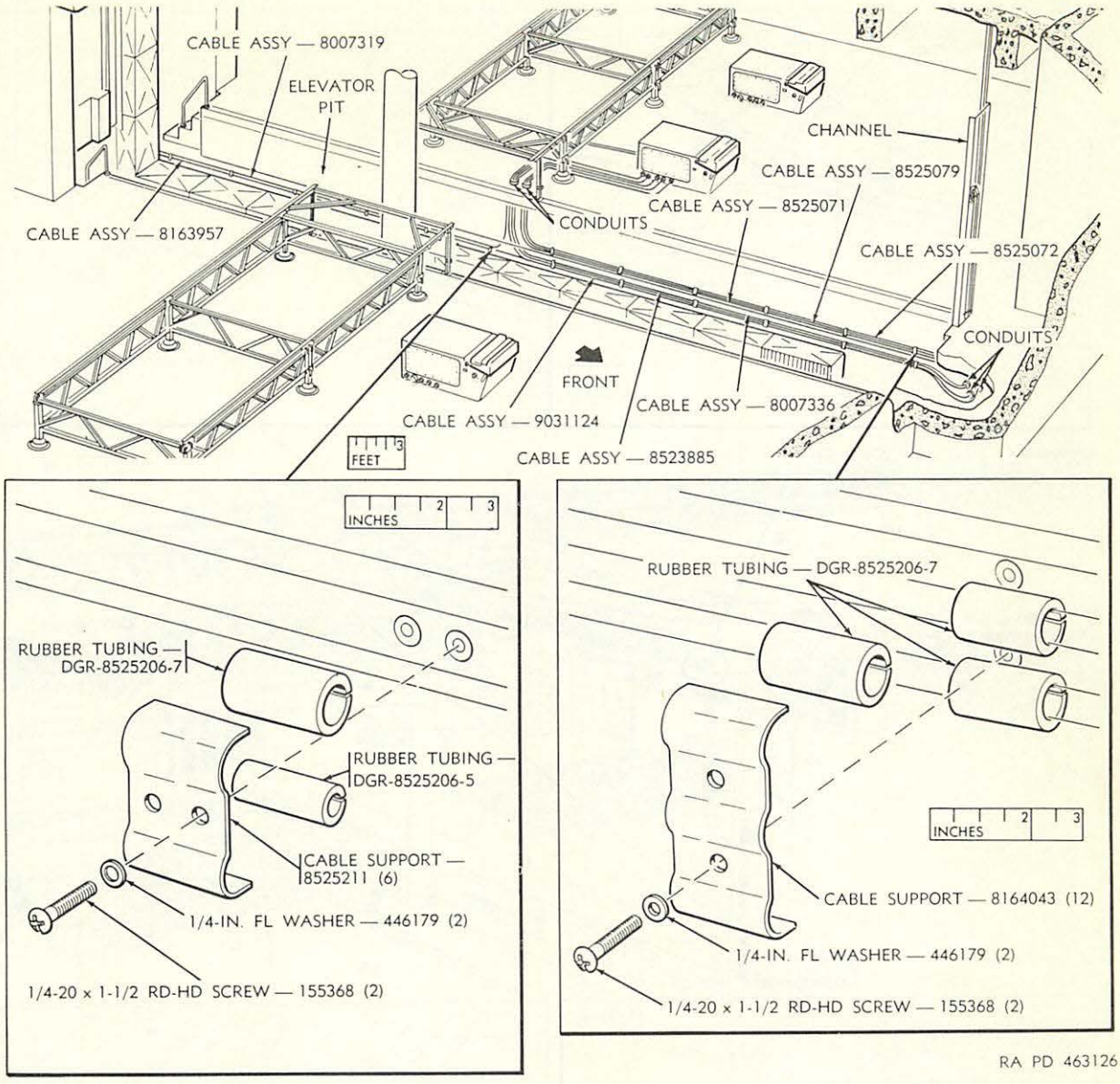


Figure 273. Launching section cable assemblies – removal and installation.

temporarily, with the cable support at the top.

(10) Lower elevator to DOWN position as described in TM 9-1440-250-12.

Note. The loop formed by the loose section of cable assemblies should be a minimum of five inches above the floor of the elevator pit. If not, raise elevator and adjust cable assemblies in channel as required.

(11) Secure cable assemblies in channel.

Note. If there is an excess of cabling between the wall at left of the elevator pit and the bottom of the channel, wind excess on the hose rack provided on the wall at left of the elevator pit.

(12) Tie loose section of cable assemblies together with plastic tape every two feet.

(13) Connect cable assemblies to receptacle connectors (C, D, and E, fig. 270) on

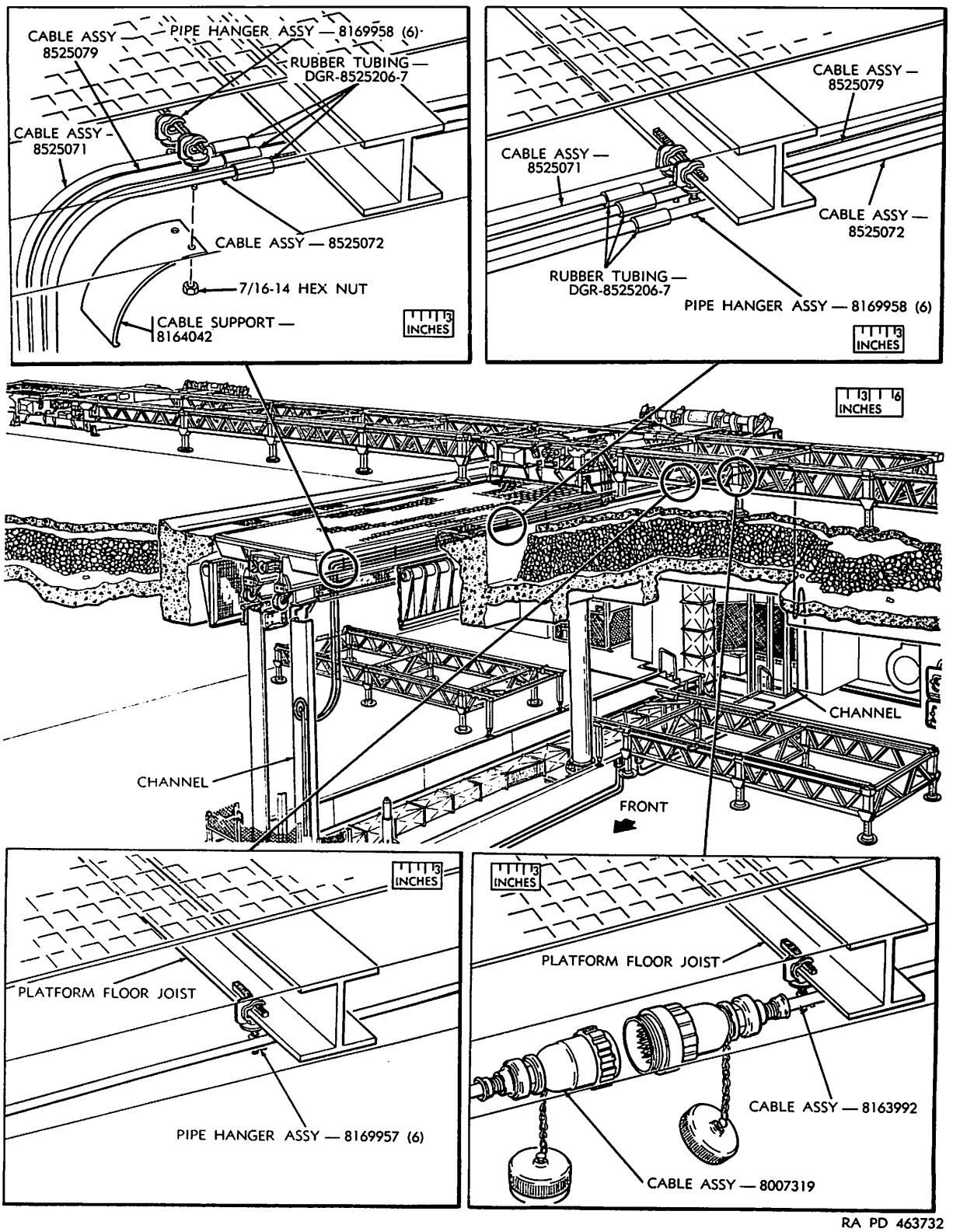
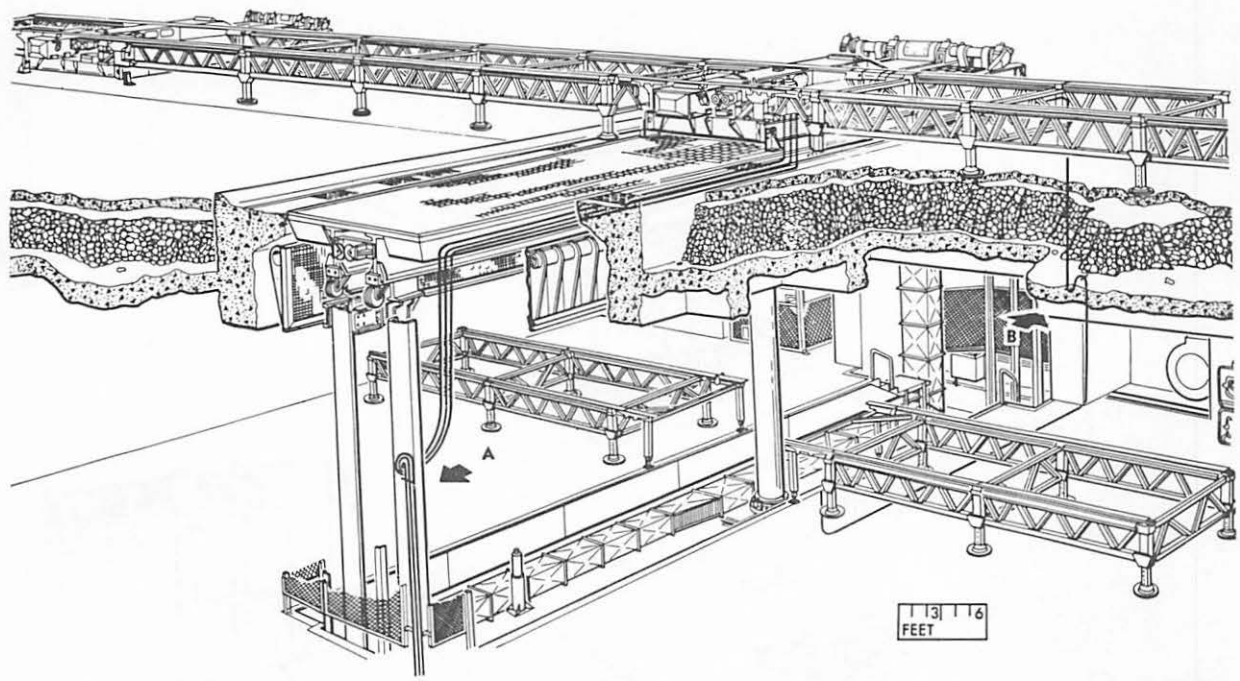


Figure 274. Launching section cable assemblies – removal and installation – Continued.



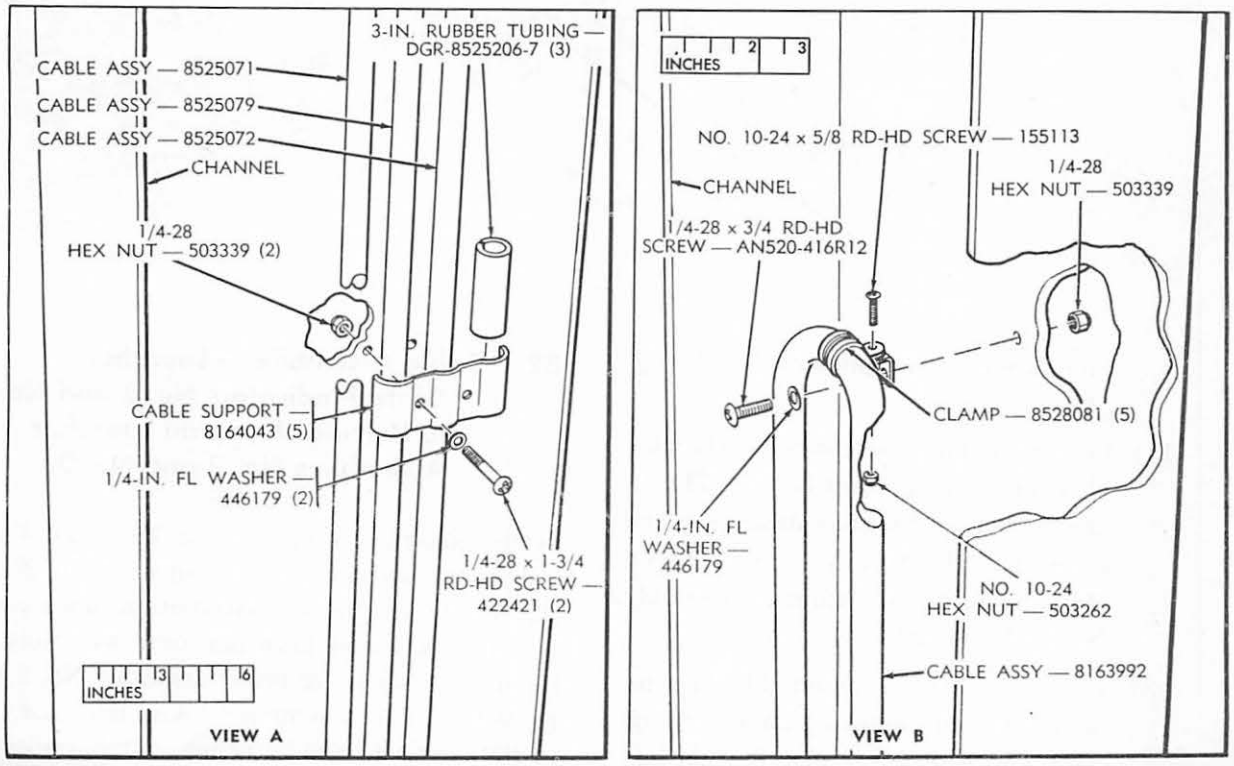


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Figure 275. Launching section cable assemblies – removal and installation – Continued.

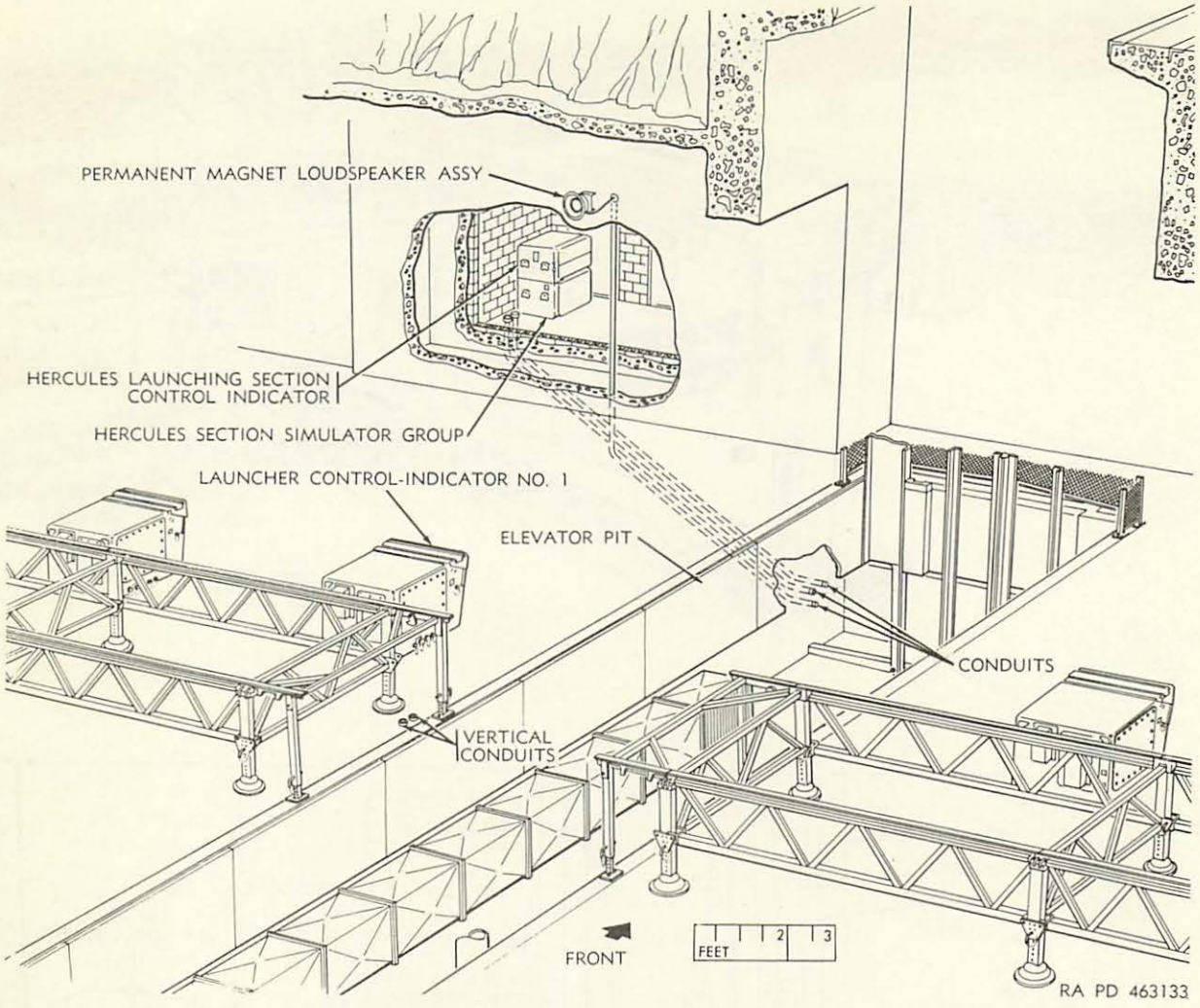


Figure 276. Conduits in storage chamber floor.

launcher control-indicator No. 1 (fig. 276)

(14) Connect cable assemblies to receptacle connectors (C and D, fig. 271) on power distribution box assembly, and connector (F of view 1, fig. 271) on Hercules monorail launcher assembly No. 1 (B, fig. 269).

(15) Wrap insulation tape on cable assemblies between mounting boxes (S, fig. 272) and the power distribution box assembly as described in paragraph 38*c*.

182. Cable Assemblies—Launcher Control-Indicators No. 2 and No. 3 to Hercules Monorail Launcher Assemblies No. 2 and No. 3

Cable assemblies (D, E, and F, fig. 269) extend from launcher control-indicator No. 2 (N, fig. 269) to the power distribution box assembly (fig. 269) and launcher base assembly of Hercules monorail launcher assembly No. 2 (G, fig. 269). Cable assemblies (AA, BB, and CC, fig. 269) extend from launcher control-indicator No. 3 (W, fig. 269) to the power distribution box assembly (fig. 271) and launcher base as-

sembly (fig. 271) and launcher base assembly of Hercules monorail launcher assembly No. 3 (A, fig. 269).

***Warning:* Before disconnecting or connecting any external power cables, turn off the section generator. Voltages DANGEROUS TO LIFE are present when the section generator is operating.**

a. Removal.

(1) Turn off the section generator.

(2) Disconnect cable assemblies from receptacle connectors (C, D, and E, fig. 270) on launcher control-indicator No. 2 or No. 3 (N or W, fig. 269).

(3) Disconnect cable assemblies from receptacle connectors (C, and D, fig. 271) on power distribution box assembly and connector (F, fig. 271) on launcher base assembly of launcher assembly No. 2 or No. 3 (G or A, fig. 269).

(4) Remove wire and insulation tape from cable assemblies.

(5) Remove tape securing cable assemblies to side trusses (DD, fig. 269) where required.

(6) Remove multiple cable retaining straps securing cable assemblies to wall of storage chamber (see fig. 277 for cable assemblies to launcher assembly No. 2, and fig. 278 for cable assemblies to launcher assembly No. 3).

(7) Attach a 25-foot pullthrough line (fig. 84) to three cable assemblies disconnected in (2) above as follows:

(*a*) Tie line in half-hitches around cable assembly three or four times, spacing half-hitches approximately three inches apart.

(*b*) Tape line to cable assembly after last half-hitch.

(8) Tie opposite end of line to any convenient part of side truss at the floor to prevent accidental pullthrough.

(9) Remove cable assemblies by releasing the retainer assemblies (D, 3, fig. 263) on the four loading rack clamp assemblies (D, fig. 263) near launcher assembly No. 2 or No. 3.

(10) Pull cable assemblies up through conduit (fig. 277 or 278) until pullthrough line is drawn through conduit.

(11) Tie opposite end of pullthrough line to any convenient part of loading rack support (L, fig. 263) to prevent accidental pullthrough.

(12) Pull cable assemblies through conduit and untie pullthrough line, leaving line in conduit.

b. Installation.

(1) Attach pullthrough line (fig. 84) in conduit to three cable assemblies as described in *a*(7) (*a*) and (*b*) above.

(2) Pull cable assemblies through conduit.

(3) Connect cable assemblies temporarily to receptacle connectors (C, D, and E, fig. 270) on launcher control-indicator No. 2 or No. 3.

(4) Secure cable assemblies to lower edge of loading rack support assembly (L, fig. 263) with plastic tape.

(5) Disconnect cable assemblies, connected in (3) above, from receptacle connectors on launcher control-indicator No. 2 or No. 3.

(6) Secure cable assemblies (fig. 277 or 278) to the wall of storage chamber.

(7) Wrap the portion of cable assemblies above ground with insulation tape as described in paragraph 38*c*.

(8) Position and secure cable assemblies in loading rack clamp assemblies (B and D, fig. 263).

(9) Untie pullthrough line and connect cable assemblies to receptacle connectors (C, D, and E, fig. 270) on launcher control-indicator No. 2 or No. 3.

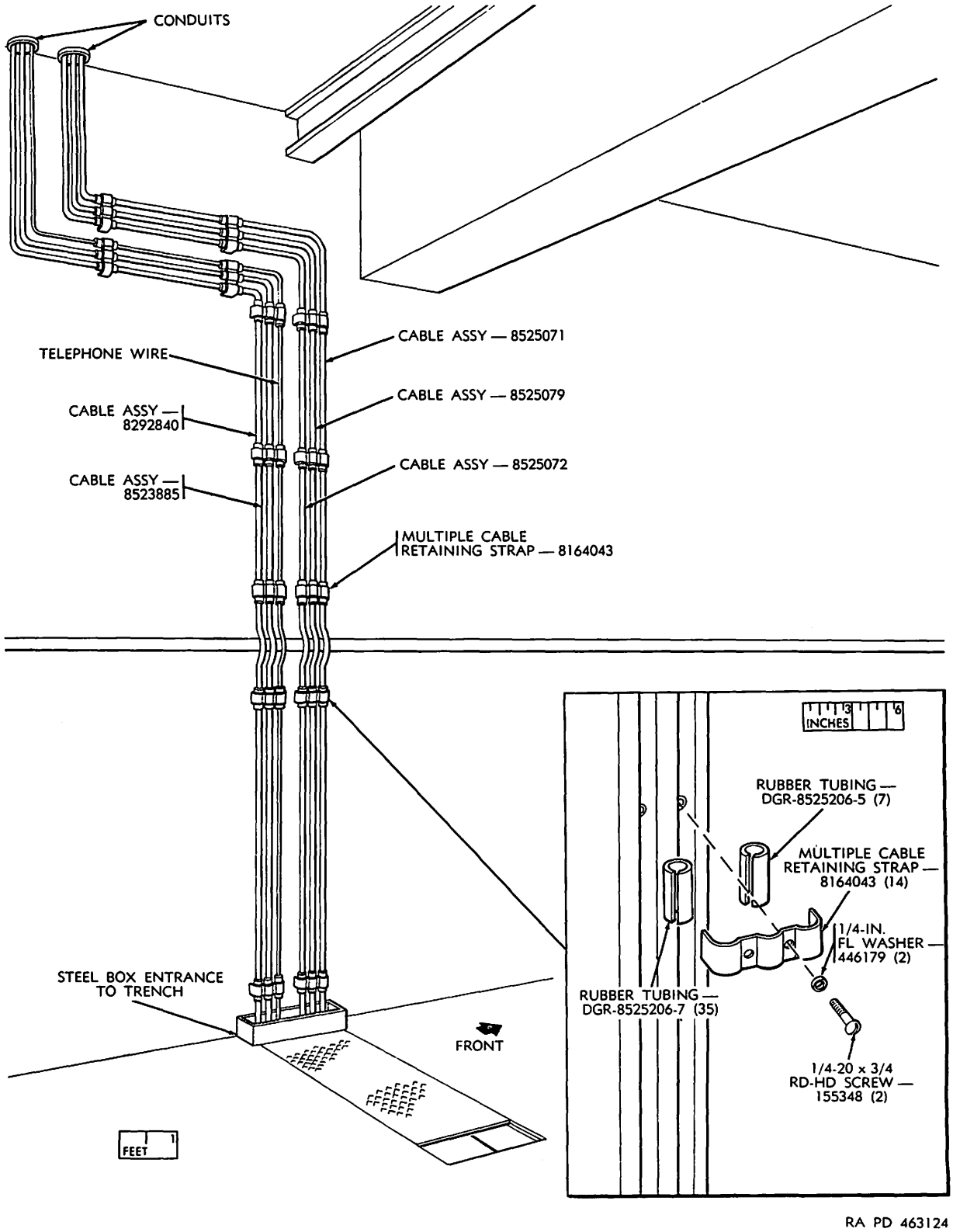


Figure 277. Left wall cable assemblies – removal and installation.

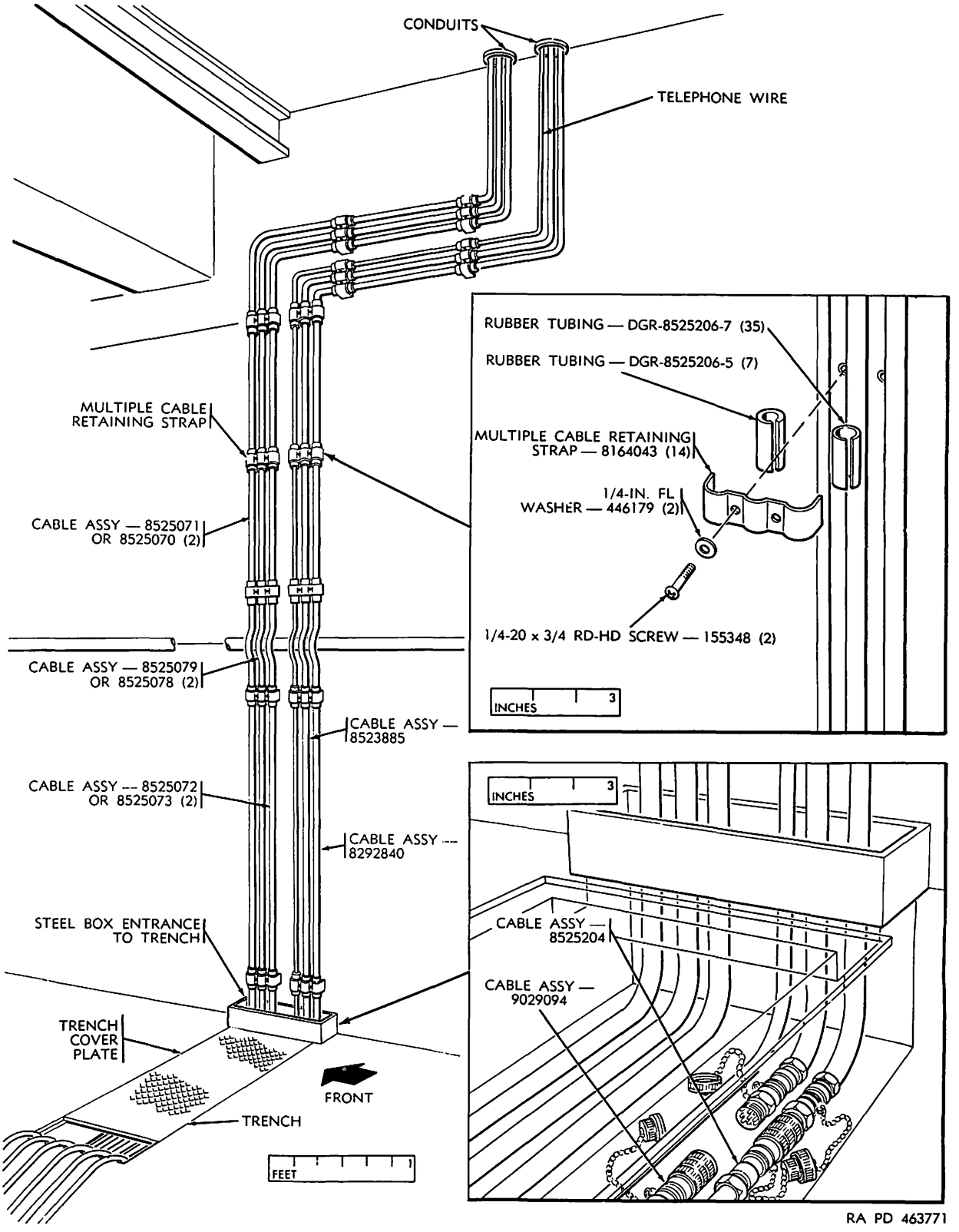


Figure 278. Right wall cable assemblies – removal and installation.

(10) Connect cable assemblies to receptacle connectors (C and D, fig. 271) on power distribution box assembly and connector (F of view 1, fig. 271) on launcher base assembly.

183. Cable Assemblies — Launcher Control-Indicator No. 4 to Hercules Monorail Launcher Assembly No. 4

Cable assemblies (J, K, and L, fig. 269) extend from launcher control-indicator No. 4 (M, fig. 269) to the power distribution box assembly (fig. 271) and the launcher base assembly of Hercules monorail launcher assembly No. 4 (H, fig. 269).

Warning: **Before disconnecting or connecting any external power cables, turn off the section generator. Voltages DANGEROUS TO LIFE are present when the section generator is operating.**

a. Removal.

(1) Turn off the section generator.

(2) Disconnect cable assemblies from receptacle connectors (C, D, and E, fig. 270) on launcher control-indicator No. 4 (M, fig. 269).

(3) Disconnect cable assemblies from receptacle connectors (C and D, fig. 271) on power distribution box assembly and connector (F of view 1, fig. 270) on launcher base assembly of launcher assembly No. 4.

(4) Remove wire and insulation tape from cable assemblies.

b. Installation.

(1) Wrap cable assemblies with insulation tape as described in paragraph 38*c*.

(2) Connect cable assemblies to receptacle connectors (C, D, and E, fig. 270) on launcher control-indicator No. 4.

(3) Connect cable assemblies to receptacle connectors (C and D, fig. 271) on power distribution box assembly and connector (F of view 1, fig. 271) on base of launcher assembly No. 4.

184. Cable Assemblies — Launcher Control-Indicator No. 3 to Trench

Cable assemblies (U and V, fig. 269) extend from launcher control-indicator No. 3 to the trench in the storage chamber floor.

Note. Cable assembly – 8523885 is an alternate for 9029094, and cable assembly – 8292840 is an alternate for 8525204.

Warning: **Before disconnecting or connecting any external power cables, turn off the section generator. Voltages DANGEROUS TO LIFE are present when the section generator is operating.**

a. Removal.

(1) Turn off the section generator.

(2) Disconnect cable assemblies from receptacle connectors (J and K, fig. 279) on Hercules launching section control-indicator (R, fig. 269).

(3) Disconnect cable assemblies from receptacle connectors (A and B, fig. 270) on launcher control-indicator No. 3 (W, fig. 269).

(4) Remove trench cover plate (fig. 278).

(5) Disconnect cable assemblies to be removed, from cable assemblies in trench, and cap open connectors.

(6) Remove cable assemblies between trench and control-indicator No. 3.

b. Installation.

(1) Connect cable assemblies to the cable assemblies in the trench.

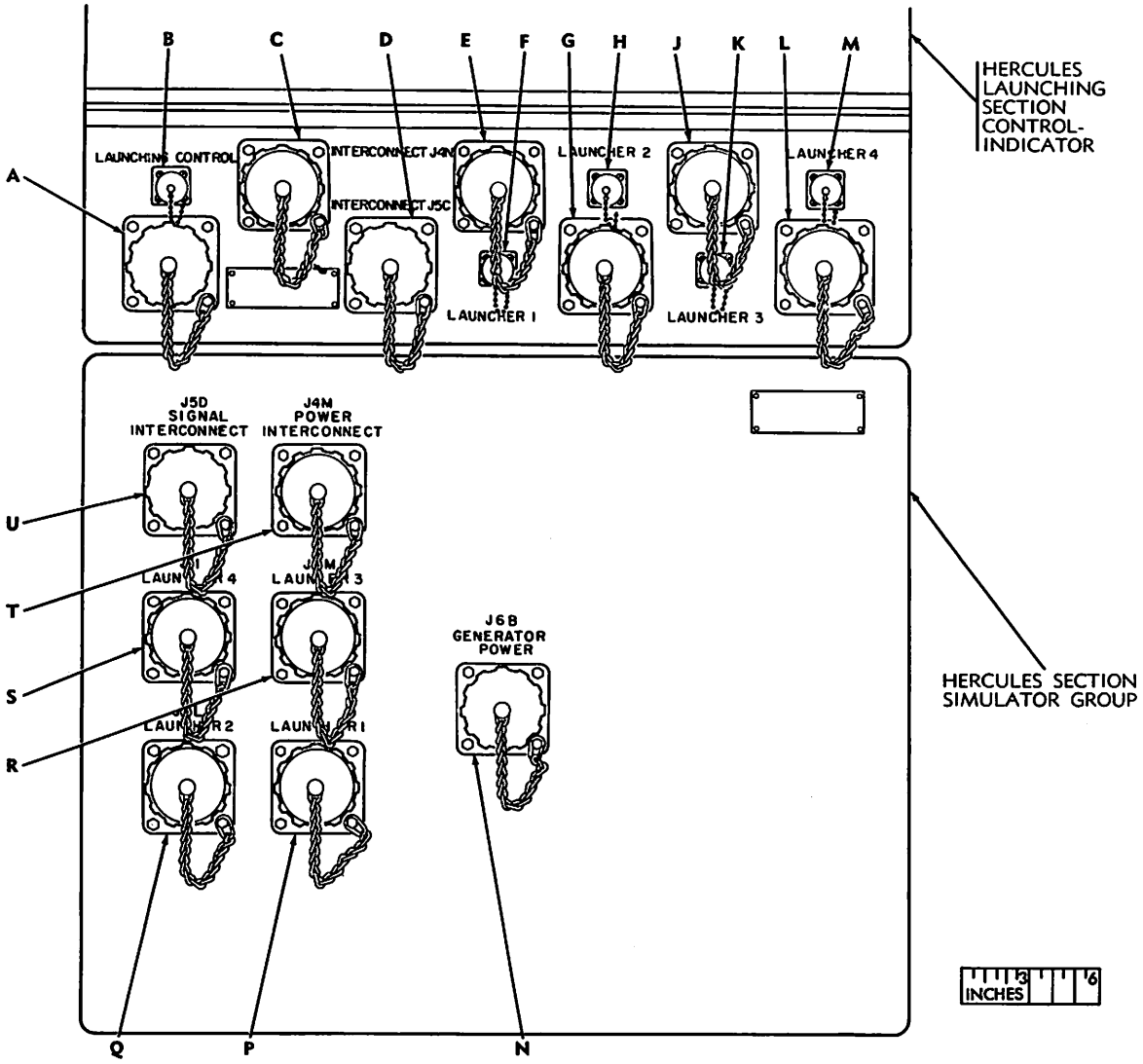
(2) Connect cable assemblies to receptacle connectors (A and B, fig. 270) on launcher control-indicator No. 3.

(3) Install cover plate (fig. 278) on trench.

(4) Connect cable assemblies to receptacle connectors (J and K, fig. 279) on the section control-indicator (R, fig. 269).

185. Cable Assembly — Hercules Monorail Launcher Assemblies No. 1 and No. 4 to Hercules Section Simulator Group

Note. The key letters shown in parentheses in this paragraph refer to figure 269 unless otherwise indicated.



KEY	RECEPTACLE CONNECTOR	CONNECTED TO RECEPTACLE CONNECTOR	ON EQUIPMENT
A	J5B	J4H	TRAILER-MOUNTED LAUNCHING CONTROL STATION
B	J88B	J92A	TRAILER-MOUNTED LAUNCHING CONTROL STATION
C	J4N	J5D	HERCULES SECTION SIMULATOR GROUP
D	J5C	J4M	HERCULES SECTION SIMULATOR GROUP
E	J4D	J5A	LAUNCHER CONTROL-INDICATOR NO. 1
F	J90E	J88A	LAUNCHER CONTROL-INDICATOR NO. 1
G	J4E	J5A	LAUNCHER CONTROL-INDICATOR NO. 2
H	J90F	J88A	LAUNCHER CONTROL-INDICATOR NO. 2
J	J4F	J5A	LAUNCHER CONTROL-INDICATOR NO. 3
K	J90G	J88A	LAUNCHER CONTROL-INDICATOR NO. 3
L	J4G	J5A	LAUNCHER CONTROL-INDICATOR NO. 4
M	J90H	J88A	LAUNCHER CONTROL-INDICATOR NO. 4
N	J6B	J1H	POWER SOURCE
P	J1K	J6A	POWER DISTRIBUTION BOX (LAUNCHER NO. 1)
Q	J1L	J6A	POWER DISTRIBUTION BOX (LAUNCHER NO. 2)
R	J1M	J6A	POWER DISTRIBUTION BOX (LAUNCHER NO. 3)
S	J1N	J6A	POWER DISTRIBUTION BOX (LAUNCHER NO. 4)
T	J4M	J5C	HERCULES LAUNCHING SECTION CONTROL-INDICATOR
U	J5D	J4N	HERCULES LAUNCHING SECTION CONTROL-INDICATOR

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Figure 279. Hercules launching section control-indicator and Hercules section simulator group — receptacle connectors.

Two cable assemblies (C) are used in a launcher sub-surface four-rack modification kit. Cable assembly—8163992 extends from the power distribution box assembly (fig. 271) on launcher assembly No. 1 (B) to a point on the underside of the elevator. At this point it connects to cable assembly—8007319 which continues to the Hercules section simulator group (Q). Another cable assembly—8163992 extends from the power distribution box assembly of Hercules monorail launcher assembly No. 4 (H) to a point on the side truss (DD) on the right side of launcher assembly No. 4. At this point it connects to cable assembly—8007319 which also continues to the Hercules launching section control-indicator (R).

Note. Cable assembly – 8292842 is a single-length alternate, equivalent to cable assemblies 8163992 and 8007319.

***Warning:* Before disconnecting or connecting any external power cables, turn off the section generator. Voltages DANGEROUS TO LIFE are present when the section generator is operating.**

a. Removal.

(1) *Launcher assembly No. 1.*

(*a*) Turn off the section generator.

(*b*) Disconnect cable assembly from receptacle connector(P, fig. 279) on section control-indicator (R).

(*c*) Disconnect cable assembly from receptacle connector (A, fig. 272) on power distribution box assembly of launcher assembly No. 1 (B).

(*d*) Remove cable assembly from mounting box (S, fig. 272).

(*e*) Disconnect cable assemblies from platform floor joists (fig. 274).

(*f*) Remove wire and insulation tape from cable assembly.

(*g*) Remove cable assembly.

(2) *Launcher assembly No. 4.*

(*a*) Turn off section generator.

(*b*) Disconnect cable assembly (C) from receptacle connector (S, fig. 279) on Hercules section simulator group (Q).

(*c*) Disconnect cable assembly (C) from receptacle connector (B, fig. 271) on power distribution box assembly of launcher assembly No. 4 (H).

(*d*) Disconnect cable assemblies as required on side truss (DD) on right side of launcher assembly No. 4.

(*e*) Remove wire and insulation tape from cable assembly.

(*f*) Remove cable assembly.

b. Installation.

(1) *Launcher assembly No. 1.*

(*a*) Connect cable assemblies—8007319 and 8163992 (fig. 274) and install on platform floor joists.

(*b*) Position and secure cable assembly (W, fig. 272) in mounting box (S, fig. 272).

(*c*) Connect cable assembly to receptacle connector (B, fig. 271) on power distribution box assembly.

(*d*) Wrap cable assembly with insulation tape as described in paragraph 38*c*.

(*e*) Connect cable assembly to receptacle connector (P, fig. 279) on Hercules section simulator group (Q).

(2) *Launcher assembly No. 4.*

(*a*) Connect cable assemblies on side truss (DD) on the right side of launcher assembly No. 4 (H).

(*b*) Wrap cable assembly with insulation tape as described in paragraph 38*c*.

(*c*) Connect cable assembly to receptacle connector (B, fig. 271) on power distribution box assembly of launcher assembly No. 4.

(*d*) Connect cable assembly to receptacle connector (S, fig. 279) on Hercules section simulator group (Q).

186. Cable Assemblies—Test Stations

Launcher control-indicators No. 1, No. 2, and No. 3 (M, L, and P, fig. 280) each have an identical set of three cable assemblies providing power to the test stations. Each cable assembly provides one test station location on the side trusses (W, fig. 280) at the front.

***Warning:* Before disconnecting or connecting any external power cables, turn off the section generator. Voltages DANGEROUS TO LIFE are present when the section generator is operating.**

a. Removal.

(1) Turn off section generator.

(2) Disconnect cable assemblies (A through K, fig. 280) as required from receptacle connectors (K through Q, fig. 270) on launcher control-indicator No. 1, No. 2, or No. 3 (P, N, or W, fig. 269).

(3) Remove cable assembly from side truss (W, fig. 280).

b. Installation.

(1) Position and install cable assembly on side truss.

(2) Connect cable assemblies (A through K, fig. 280) as required to receptacle connectors (K through Q, fig. 270) on launcher control-indicator No. 1, No. 2, or No. 3 (P, N, or W, fig. 269).

187. Cable Assembly—Lift and Door Control Panel

Cable assembly (S, fig. 269) extends from launcher control-indicator No. 1 (P, fig. 269) to the lift and door control panel (fig. 281).

***Warning:* Before disconnecting or connecting any external power cables, turn off the section generator. Voltages DANGEROUS TO LIFE are present when the section generator is operating.**

a. Removal.

(1) Turn off the section generator.

(2) Disconnect cable assembly from receptacle connector (S, fig. 270) on launcher control-indicator No. 1 (P, fig. 269).

(3) Disconnect cable assembly from lift and door control panel (fig. 281), refer to paragraph 38*d*, and identify wires of cable assembly.

(4) Attach a 25-foot pullthrough line (fig. 84) to cable assembly as follows:

(*a*) Tie line in half-hitches around cable assembly three or four times, spacing half-hitches approximately three inches apart.

(*b*) Tape line to cable assembly after last half-hitch.

(*c*) Tape all terminals to line so as to form a long taper.

(5) Tie opposite end of pullthrough line to any convenient part of control panel to prevent accidental pullthrough.

(6) Pull cable assembly through conduit (fig. 281) and into elevator pit and untie pullthrough line, leaving line in conduit.

(7) Remove cable assembly from clamps (fig. 281) and cable supports (fig. 273).

(8) Remove cable assembly from vertical conduit (fig. 276).

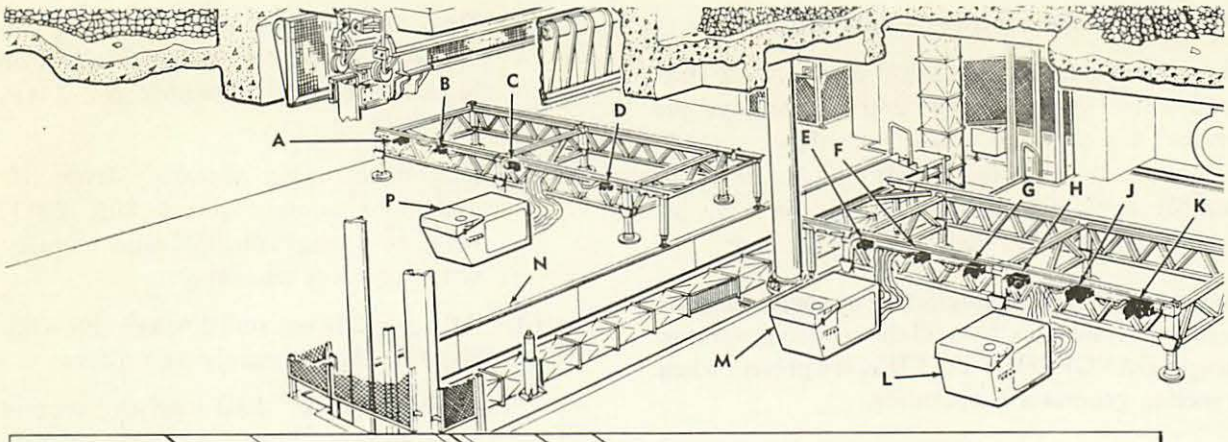
b. Installation.

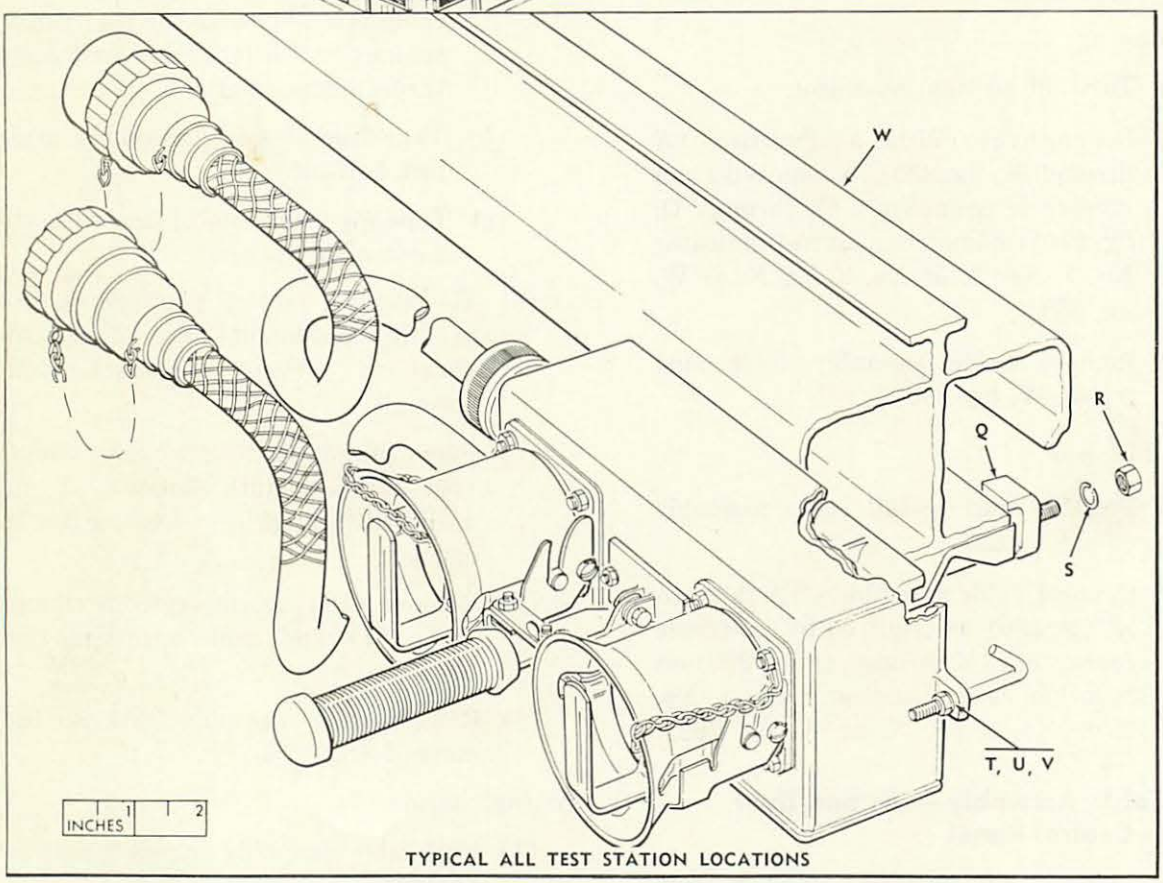
(1) Pull cable assembly through vertical conduit.

(2) Position cable assembly and secure in elevator pit with cable supports (fig. 273) and clamps (fig. 281).

(3) Attach pullthrough line in conduit to cable assembly (fig. 84) as described in *a*(4) (*a*) through (*c*) above.

(4) Pull cable assembly through conduit (fig. 281) to the lift and door control panel.





TYPICAL ALL TEST STATION LOCATIONS

A — CABLE ASSY — 8525076 (TEST STATION 9)
B — CABLE ASSY — 8525076 (TEST STATION 9 ALTERNATE)
C — CABLE ASSY — 8525075 (TEST STATION 8)
D — CABLE ASSY — 8167662 (TEST STATION 7)
E — CABLE ASSY — 8525076 (TEST STATION 6)
F — CABLE ASSY — 8525075 (TEST STATION 5)
G — CABLE ASSY — 8167662 (TEST STATION 4)
H — CABLE ASSY — 8525076 (TEST STATION 3)
J — CABLE ASSY — 8525075 (TEST STATION 2)
K — CABLE ASSY — 8167662 (TEST STATION 1)
L — LAUNCHER CONTROL-INDICATOR NO. 2
M — LAUNCHER CONTROL-INDICATOR NO. 1
N — ELEVATOR PIT
P — LAUNCHER CONTROL-INDICATOR NO. 3
Q — LOADING RACK CLAMP — 8167401
R — 3 8-16 HEX NUT — MS35690-602
S — 3 8-IN. LOCK WASHER — MS35338-46
T — LAUNCHER HOOK STUD — 8167402
U — 5 16-IN. LOCK WASHER — MS35338-45
V — 5 16-18 HEX-NUT — MS35690-505
W — SIDE TRUSS — 8165948 (8)

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Figure 280. Test station cable assemblies – removal and installation.

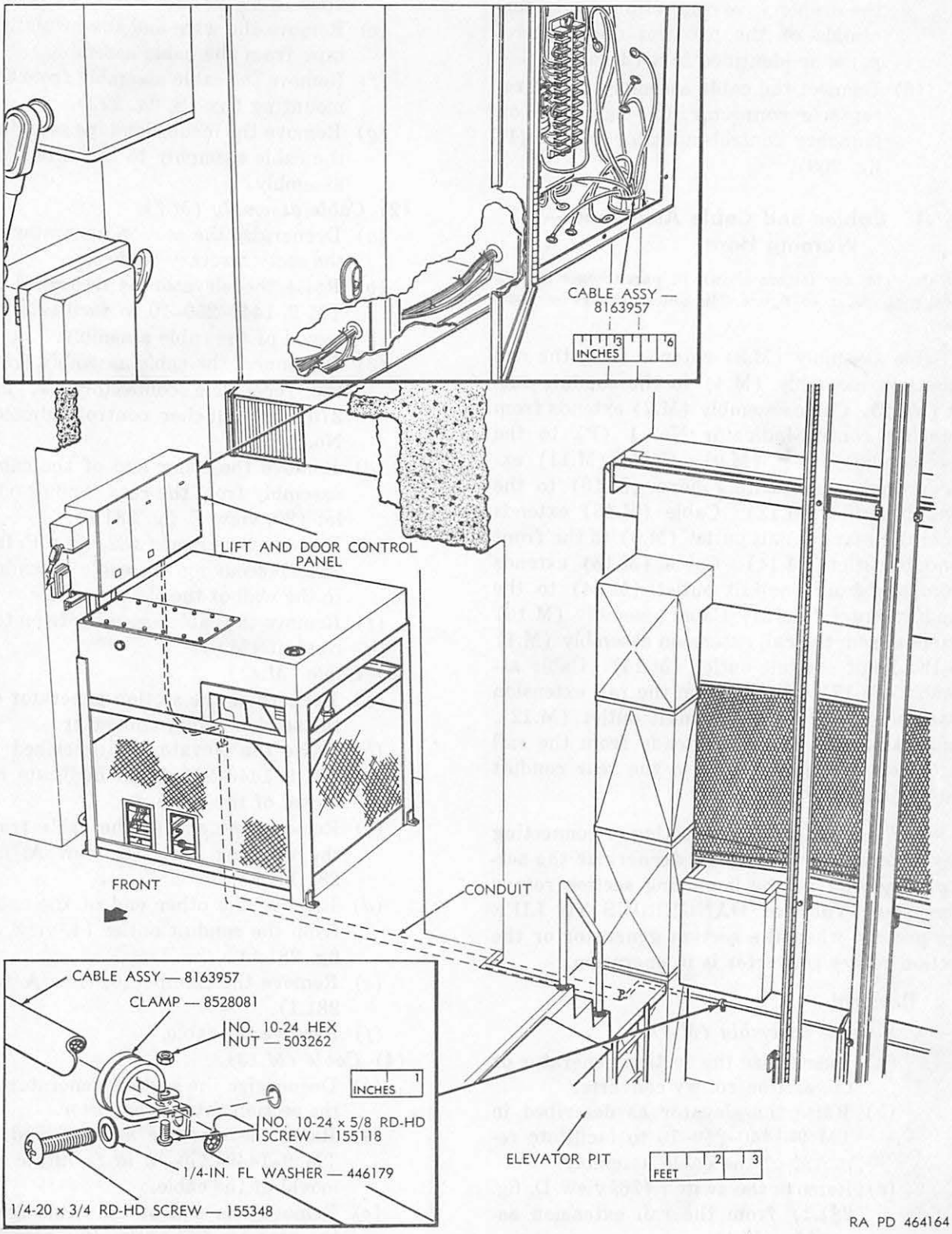


Figure 281. Cable assembly – lift and door control panel – removal and installation.

(5) Untie the pullthrough line and make the proper wire connections to the terminals of the lift and door control panel as identified in *a* (3) above.

(6) Connect the cable assembly to the receptacle connector (S, fig. 270) on launcher control-indicator No. 1 (P, fig. 269).

187.1. Cables and Cable Assemblies—Warning Horn

Note. The key letters shown in parentheses in this paragraph refer to figure 269 unless otherwise indicated.

Cable assembly (M.3) extends from the rail extension assembly (M.4) to the conduit outlet (M.12). Cable assembly (M.7) extends from launcher control-indicator No. 1 (P) to the rear conduit outlet (M.9). Cable (M.11) extends from the warning horn (M.10) to the conduit outlet (M.12). Cable (M.13) extends from the rear conduit outlet (M.9) to the front conduit outlet (M.14). Cable (M.15) extends from the front conduit outlet (M.14) to the conduit outlet (M.12). Cable assembly (M.16) extends from the rail extension assembly (M.1) to the front conduit outlet (M.14). Cable assembly (M.17) extends from the rail extension assembly (M.2) to the conduit outlet (M.12). Cable assembly (M.18) extends from the rail extension assembly (M.5) to the rear conduit outlet (M.9).

Warning: **Before disconnecting or connecting any external power cables, deenergize the section generator or the launching section rotary converter. Voltages DANGEROUS TO LIFE are present when the section generator or the section rotary converter is in operation.**

a. Removal.

(1) *Cable assembly (M.3).*

(*a*) Deenergize the section generator or the section rotary converter.

(*b*) Raise the elevator as described in TM 9–1440–250–10 to facilitate removal of the cable assembly.

(*c*) Remove the switch (26, view D, fig. 281.1) from the rail extension assembly (M.4).

(*d*) Remove the other end of the cable assembly from the conduit outlet (4, view A, fig. 281.1).

(*e*) Remove the wire and the insulation tape from the cable assembly.

(*f*) Remove the cable assembly from the mounting box (S, fig. 272).

(*g*) Remove the insulation tape securing the cable assembly to the extension assembly.

(2) *Cable assembly (M.7).*

(*a*) Deenergize the section generator or the section rotary converter.

(*b*) Raise the elevator as described in TM 9–1440–250–10 to facilitate removal of the cable assembly.

(*c*) Disconnect the cable assembly from the receptacle connector (T, fig. 270) on launcher control-indicator No. 1 (P).

(*d*) Remove the other end of the cable assembly from the rear conduit outlet (20, view C, fig. 281.1).

(*e*) Remove the clamps (32, view F, fig. 281.1) securing the cable assembly to the wall of the elevator pit.

(*f*) Remove the cable assembly from the conduit (M.6).

(3) *Cable (M.11).*

(*a*) Deenergize the section generator or the section rotary converter.

(*b*) Raise the elevator as described in TM 9–1440–250–10 to facilitate removal of the cable.

(*c*) Remove one end of the cable from the warning horn (6, view A, fig. 281.1).

(*d*) Remove the other end of the cable from the conduit outlet (4, view A, fig. 281.1).

(*e*) Remove the clamp (10, view A, fig. 281.1).

(*f*) Remove the cable.

(4) *Cable (M.13).*

(*a*) Deenergize the section generator or the section rotary converter.

(*b*) Raise the elevator as described in TM 9–1440–250–10 to facilitate removal of the cable.

(*c*) Remove one end of the cable from the rear conduit outlet (20, view C, fig. 281.1).

(*d*) Remove the other end of the cable from the front conduit outlet (20, view C, fig. 281.1).

(*e*) Remove the clamps (29, view E, fig. 281.1) securing the cable to the wall of the elevator pit.

(*f*) Remove the cable.

(5) *Cable (M.15).*

(*a*) Deenergize the section generator or the section rotary converter.

(*b*) Raise the elevator as described in TM 9–1440–250–10 to facilitate removal of the cable.

(*c*) Remove one end of the cable from the conduit outlet (4, view A, fig. 281.1).

(*d*) Remove the other end of the cable from the front conduit outlet (20, view C, fig. 281.1).

(*e*) Remove the twine (33, view G, fig. 281.1) securing the cable to the existing cable assemblies on the channel (34, view G, fig. 281.1).

(*f*) Remove the twine securing the cable to the existing cable assemblies (fig. 274) on the platform floor joist.

(*g*) Remove the cable.

(6) *Cable assembly (M.16).*

(*a*) Deenergize the section generator or the section rotary converter.

(*b*) Raise the elevator as described in TM 9–1440–250–10 to facilitate removal of the cable assembly.

(*c*) Remove the switch (16, view B, fig. 281.1) from the rail extension assembly (M.1).

(*d*) Remove the other end of the cable assembly from the front conduit outlet (20, view C, fig. 281.1).

(*e*) Remove the clamps (29, view E, fig. 281.1) securing the cable assembly to the wall of the elevator pit.

(*f*) Remove the insulation tape securing the cable assembly to the rail extension assembly (M.1).

(*g*) Remove the cable assembly.

(7) *Cable assembly (M.17).*

(*a*) Deenergize the section generator or the section rotary converter.

(*b*) Raise the elevator as described in TM 9–1440–250–10 to facilitate removal of the cable assembly.

(*c*) Remove the switch (26, view D, fig. 281.1) from the rail extension assembly (M.2).

(*d*) Remove the other end of the cable assembly from the conduit outlet (4, view A, fig. 281.1).

(*e*) Remove the cable assembly from the mounting box (S, fig. 272).

(*f*) Remove the wire and the insulation tape from the cable assembly.

(*g*) Remove the cable assembly.

(8) *Cable assembly (M.18).*

(*a*) Deenergize the section generator or the section rotary converter.

(*b*) Raise the elevator as described in TM 9–1440–250–10 to facilitate removal of the cable assembly.

(*c*) Remove the switch (16, view B, fig. 281.1) from the rail extension assembly (M.5).

(*d*) Remove the other end of the cable assembly from the rear conduit outlet (20, view C, fig. 281.1).

(*e*) Remove the clamps (32, view F, fig. 281.1) securing the cable assembly to the wall of the elevator pit.

(*f*) Remove the insulation tape securing the cable assembly to the rail extension assembly (M.5).

(*g*) Remove the cable assembly from the conduit (M.8).

b. Installation.

(1) *Cable assembly (M.3).*

(*a*) Install the switch (26, view D, fig. 281.1) on the rail extension assembly (M.4).

(*b*) Pull the other end of the cable assembly through the mounting box (S, fig. 272).

Note. For connection of the cable assembly wires within the conduit outlet, refer to TM 9–1440–250–35.

(*c*) Install the end of the cable assembly in the conduit outlet (4, view A, fig. 281.1).

(*d*) Secure the cable assembly to the rail extension assembly (M.4) with insulation tape.

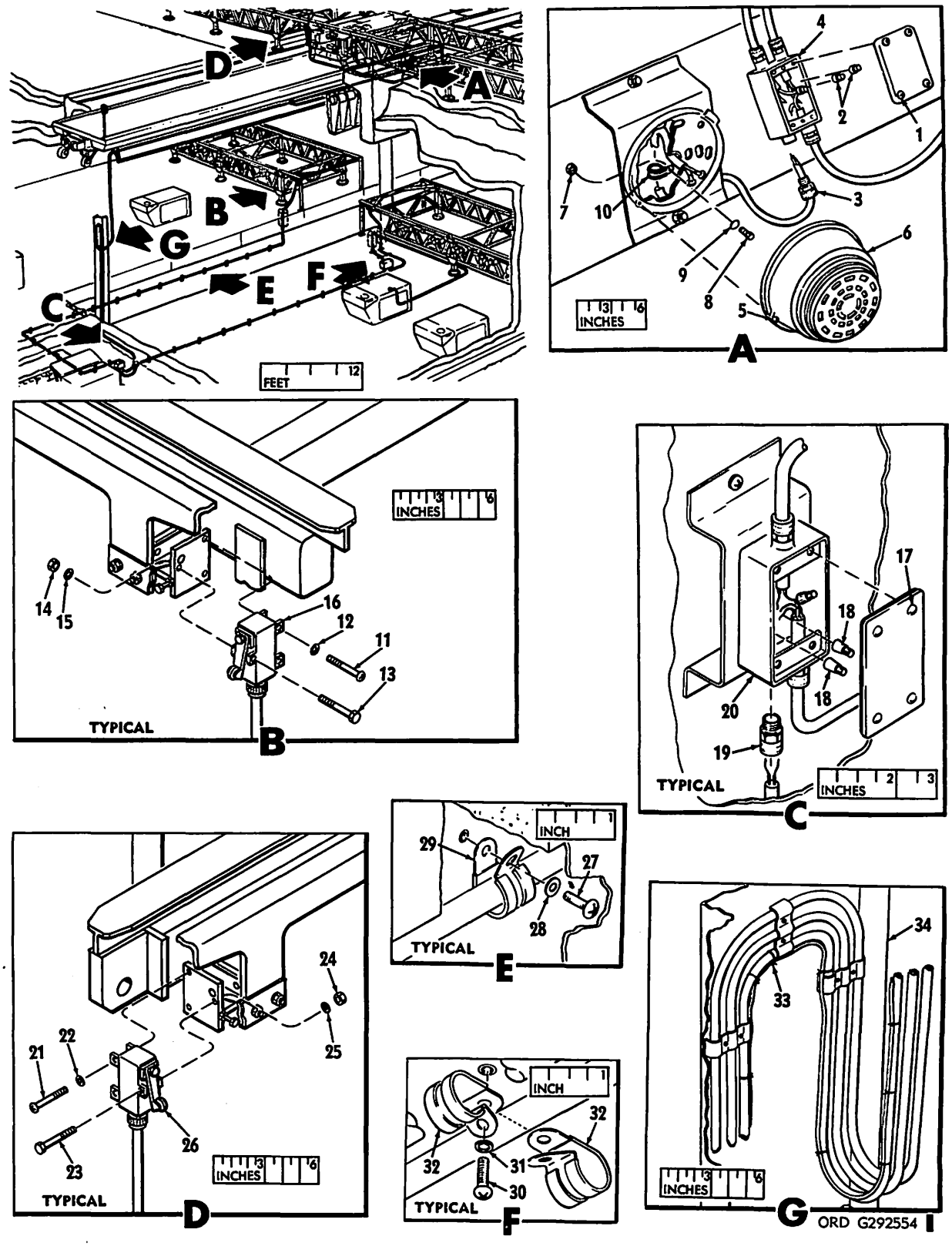


Figure 281.1. Removal and installation of the warning horn cables and cable assemblies.

1—Captive screw (4)
2—Conductor splice 8169765 (3)
3—Connector 570052 (4)
4—Conduit outlet 9026664
5—Captive screw (2)
6—Warning horn 8527321
7—No. 10–32 hex. nut NAS1021N3
8—No. 10–32 x 1 1/32 hex-hd bolt AN3–10A
9—No. 10 fl washer MS15795–208
10—Clamp MS21919DG8
11—No. 8–32 x 1.656 brazier-hd screw NAS220–26 (2)
12—No. 8 fl washer AN960–8 (2)
13—No. 8–32 x 1.906 brazier-hd screw NAS220–30
14—No. 8–32 self-lkg hex. nut MS20365–832A
15—No. 8 fl washer AN960–8
16—Switch (p/o cable assembly 8525353 and 8525355)
17—Captive screw (4)
18—Conductor splice 8167965 (3)
19—Connector 570052 (3)
20—Conduit outlet 9033640
21—No. 8–32 x 1.656 brazier-hd screw NAS220–26 (2)
22—No. 8 fl washer AN960–8 (2)
23—No. 8–32 x 1.906 brazier-hd screw NAS220–30
24—No. 8–32 self-lkg hex. nut MS20365–832A
25—No. 8 fl washer AN960–8
26—Switch (p/o cable assembly 8525353 and 9032612)
27—No. 10–24 x 5/8 rd-hd screw AN515–10R10
28—No. 10 fl washer 446161
29—Clamp MS21919DG8
30—No. 10–24 x 5/8 rd-hd screw AN515–10R10
31—No. 10 fl washer 446161
32—Clamp MS21919DG8 (2)
33—Nylon twine 4020–641–8650
34—Channel

Figure 281.1. Removal and installation of the warning horn cables and cable assemblies—legend.

(*e*) Wrap the exposed portion of the cable assembly with insulation tape as described in paragraph 38*c*.

(*f*) Secure the cable assembly in the mounting box (S, fig. 272).

(2) *Cable assembly (M.7).*

(*a*) Connect one end of the cable assembly to the receptacle connector (T, fig. 270) on launcher control indicator No. 1 (P).

(*b*) Pull the other end of the cable assembly through the conduit (M.6).

Note. For connection of cable wires within the conduit outlets, refer to TM 9–1440–250–35.

(*c*) Install the end of the cable assembly in the rear conduit outlet (20, view C, fig. 281.1).

(*d*) Secure the cable assembly in the clamps (32, view F, fig. 281.1) to the wall of the elevator pit.

(3) *Cable (M.11).*

Note. For connection of cable wires to the warning horn and within the conduit outlet refer to TM 9–1440–250–35.

(*a*) Install one end of the cable to the warning horn (6, view A, fig. 281.1).

(*b*) Install the other end of the cable in the conduit outlet (4, view A, fig. 281.1).

(*c*) Install the clamp (10, view A, fig. 281.1).

(4) *Cable (M.13).*

Note. For connection of cable wires within the conduit outlets, refer to TM 9–1440–250–35.

(*a*) Install one end of the cable in the rear conduit outlet (20, view C, fig. 281.1).

(*b*) Temporarily secure the cable in the clamps (29, view E, fig. 281.1) on the wall of the elevator pit.

(*c*) Install the other end of the cable in the front conduit outlet (20, view C, fig. 281.1).

(*d*) Secure the cable in the loop clamps to the wall of the elevator pit.

(5) *Cable (M.15).*

Note. For connection of cable wires within the conduit outlets, refer to TM 9–1440–250–35.

(*a*) Install one end of the cable in the front conduit outlet (20, view C, fig. 281.1).

(*b*) Secure the cable to the existing cable assemblies in the channel (34, view G, fig. 281.1) with nylon twine (33, view G, fig. 281.1).

(*c*) Secure the cable to the existing cable assemblies (fig. 274) along the platform floor with nylon twine.

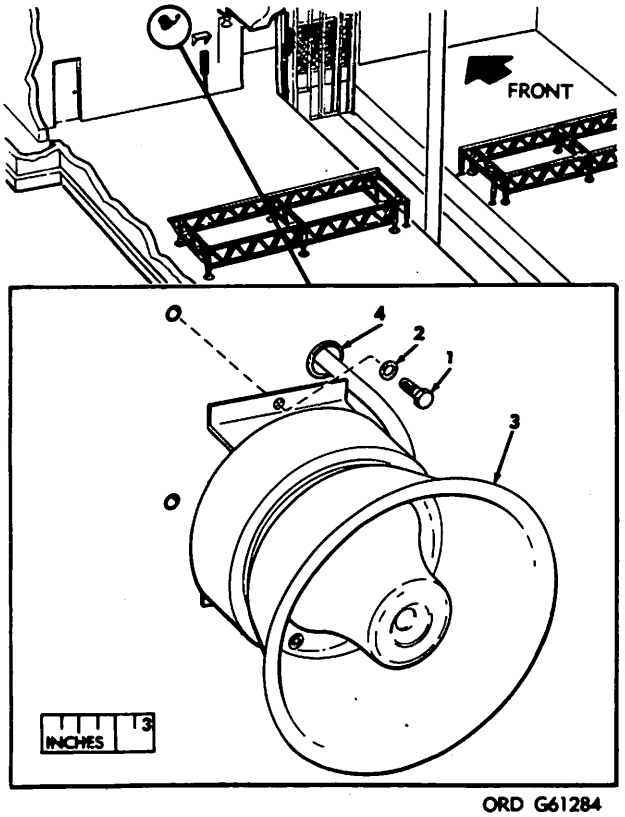
Note. The loop formed by the cable should not exceed the loop formed by the existing cable assemblies.

(*d*) Install the end of the cable in the conduit outlet (4, view A, fig. 281.1).

(6) *Cable assembly (M.16).*

(*a*) Install the switch (16, view B, fig. 281.1) on the rail extension assembly (M.1).

Note. For connection of cable assembly wires within the conduit outlet, refer to TM 9–1440–250–35.



1—No. 10-24 x 25/32 hex-hd bolt AN73A4 (2)
2—No. 10 fl washer 446161 (2)
3—Permanent magnet loudspeaker assembly 9031124
4—Conduit

Figure 282. Removal and installation of the permanent magnet loudspeaker assembly.

(*b*) Install the other end of the cable assembly in the front conduit outlet (20, view C, fig. 281.1).

(*c*) Secure the cable assembly to the rail extension assembly (M.1) with insulation tape.

(*d*) Secure the cable assembly in the clamps (29, view E, fig. 281.1) to the wall of the elevator pit.

(7) *Cable assembly (M.17).*

(*a*) Install the switch (26, view D, fig. 281.1) on the rail extension assembly (M.2).

(*b*) Pull the other end of the cable assembly through the mounting box (S, fig. 272).

Note. For connection of cable assembly wires within the conduit outlet, refer to TM 9-1440-250-35.

(*c*) Install the end of the cable assembly in the conduit outlet (4, view A, fig. 281.1).

(*d*) Wrap the exposed portion of the cable assembly with insulation tape as described in paragraph 38*c*.

(*e*) Secure the cable assembly in the mounting box (S, fig. 272).

(8) *Cable assembly (M.18).*

(*a*) Install the switch (16, view B, fig. 281.1) on the rail extension assembly (M.5).

(*b*) Pull the other end of the cable assembly through the conduit (M.8).

Note. For connection of cable assembly wires within the conduit outlet, refer to TM 9-1440-250-35.

(*c*) Install the end of the cable assembly in the rear conduit outlet (20, view C, fig. 281.1).

(*d*) Secure the cable assembly to the rail extension assembly (M.5) with insulation tape.

(*e*) Secure the cable assembly in the clamps (32, view F, fig. 281.1) to the wall of the elevator pit.

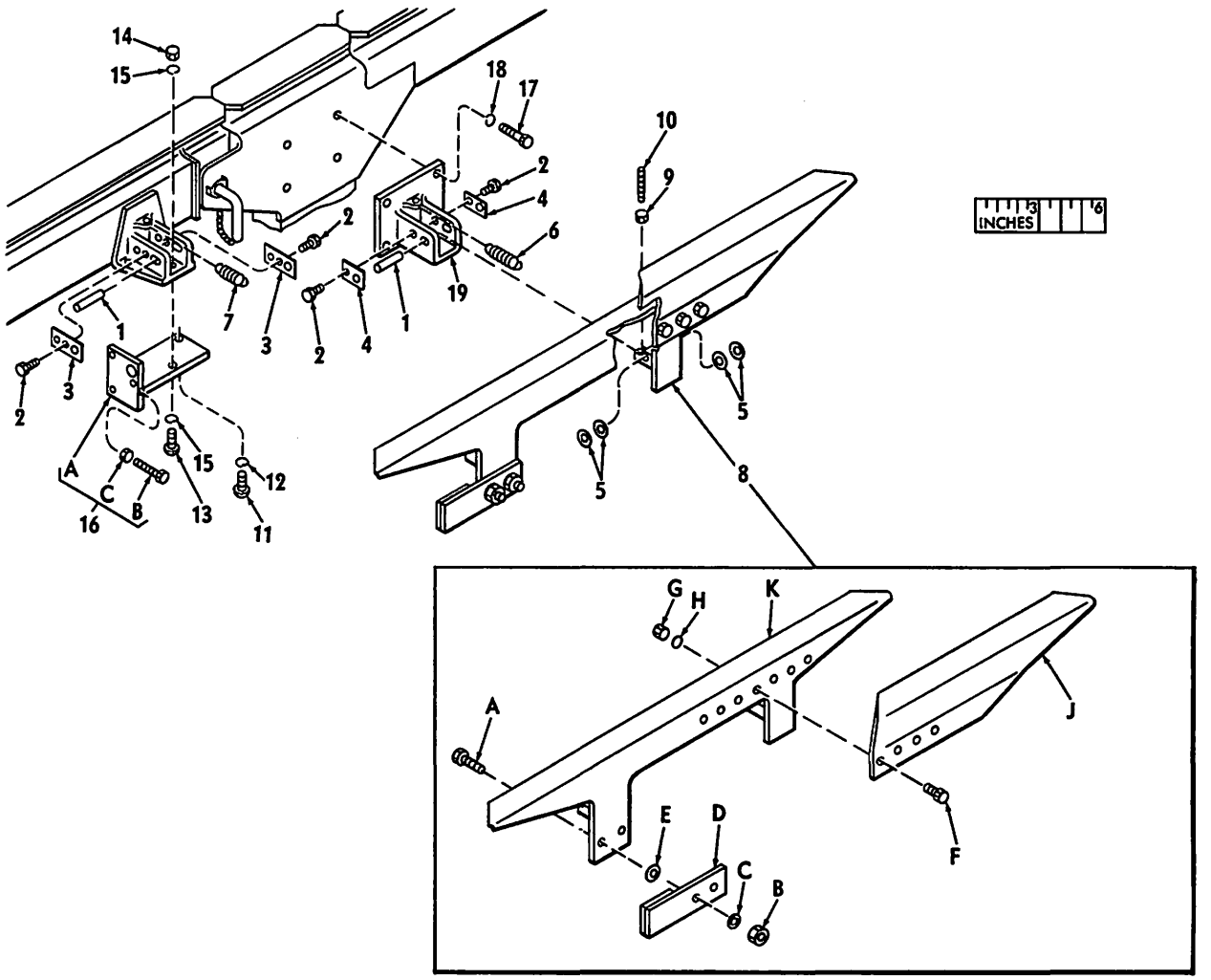
188. Permanent Magnet Loudspeaker Assembly

A permanent magnet loudspeaker assembly (fig. 276) is located on the wall at the front of the storage chamber. The cable of the loudspeaker assembly extends through a conduit (4, fig. 282) to launcher control-indicator No. 1 (P, fig. 269).

a. Removal.

(1) Disconnect the cable of the loudspeaker assembly from the receptacle connector (R, fig. 270) on launcher control-indicator No. 1 (P, fig. 269).

(2) Remove the cable from the vertical conduit (fig. 276).



1—0.375 dia x 2.250 spg pin MS9048-303
2—No. 10-32 x 0.463 self-lkg hex-hd bolt NAS1223-2 (1 through 193 and 50002 through 50021)
3—Bar 9978790 (1 through 193 and 50002 through 50021)
4—Bar 9979020 (1 through 193 and 50002 through 50021)
5—⅜ fl washer AN960-616L (8)
6—Spring 9021214
7—Spring 9021215
8—Switch actuator arm 9977519-3 (right) or 9977519-4 (left)
A—¼-28 x 1 hex-hd cap screw MS35298-8 (2)
B—¼-28 self-lkg hex. nut NAS1021N4 (2)
C—¼ fl washer AN960-416 (2)
D—Arm 9979019
E—17/64-id x ⅞-od fl washer 8162218 (as required)
F—5/16-24 x 0.937 hex-hd bolt NAS1105-9 (4)
G—5/16-24 self-lkg hex. nut NAS1021N5 (4)
H—5/16 fl washer 502245 (4)
J—Bracket 9152343-1 (right) or 9152343-2 (left)
K—Arm 9032632 (right) or 9032679 (left)
9—No. 10-32 hex. nut MS35650-102 (2)
10—No. 10-32 x 1 oval-pt setscrew AN56F1032H16 (2)
11—No. 8-32 x ⅝ pan-hd screw MS35206-43 (2)
12—No. 10 lockwasher MS35338-43 (2)
13—No. 8-32 x ⅞ pan-hd screw MS35206-45.
14—No. 8-32 self-lkg hex. nut NAS1021N08
15—No. 10 lockwasher MS35338-43
16—Switch mounting bracket 9978792-2 (right) or 9978792-1 (left)
A—Tee 9152424-2 (right) or 9152424-1 (left)
B—No. 10-32 x 1 hex-hd bolt NAS428-3-10
C—No. 10-32 hex. nut MS25082-3
17—No. 10-32 x 2 1/32 hex-hd bolt AN73A5 (4)
18—No. 10 lockwasher MS35338-24 (4)
19—Shaft positioning bracket 9032649

Figure 284. Switch actuator arm—removal, disassembly, assembly, and installation—typical.

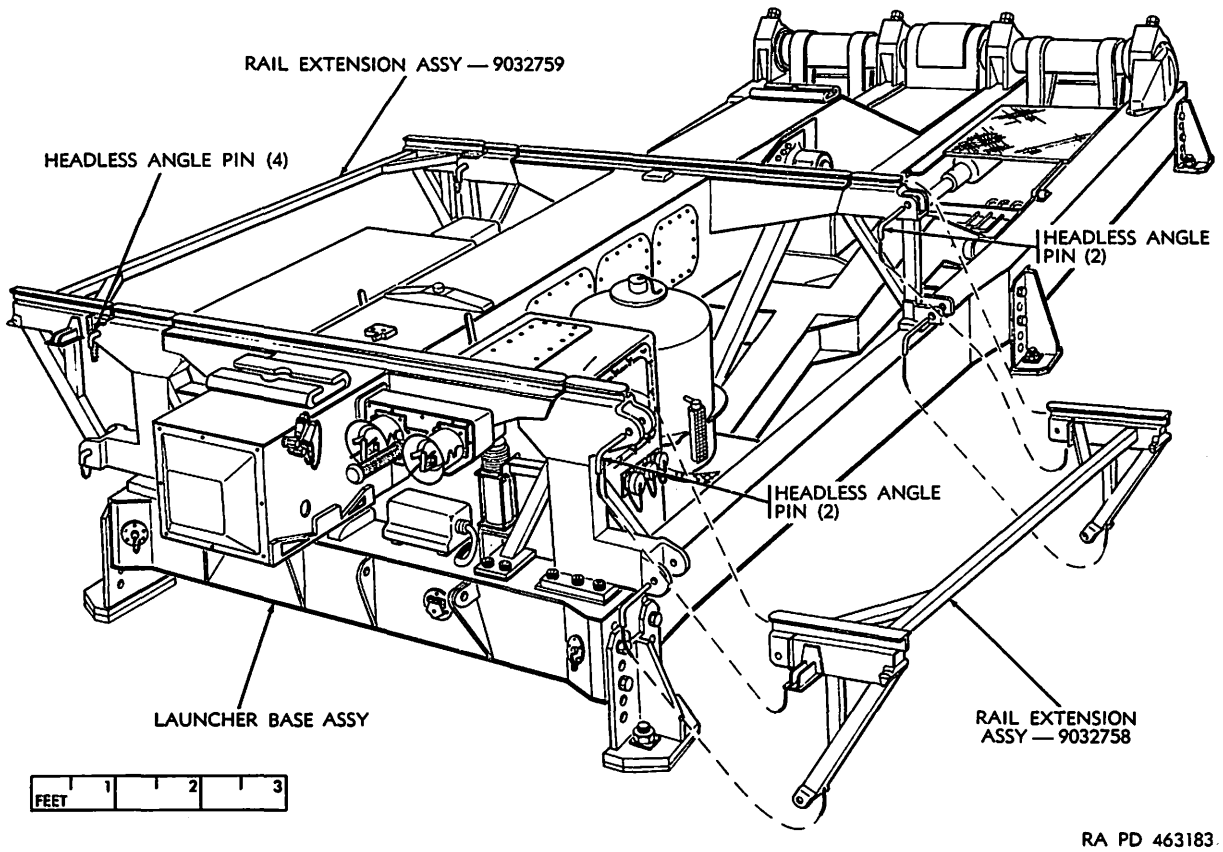


Figure 285. Rail extension assemblies—removal and installation.

(2) Trim the track section of the adapter assembly as required to clear the rail extension.

Note. Clearance must not exceed ½ inch.

(3) Install the adapter assembly.

192. Rail Extension Assembly and Switch Actuator Arm

Note. The key numbers shown in parentheses in this paragraph refer to figure 284 unless otherwise indicated.

a. Removal.

(1) Remove the spring pins (1) and the springs (6 and 7).

(2) Remove and disassemble the switch actuator arm (8).

(3) Remove and disassemble the switch mounting bracket (16).

(4) Remove the shaft positioning bracket (19).

(5) Remove the rail extension assembly (fig. 285).

b. Installation.

(1) Position and secure the rail extension assembly (fig. 285).

(2) Install the shaft positioning bracket (19).

(3) Assemble and install the switch mounting bracket (16).

(4) Assemble and position the switch actuator arm (8).

(5) Install the springs (6 and 7) and the spring pins (1).

(6) Adjust the setscrews (10) to position the switch actuator arm 1⅜-inch from the tee track of the rail extension assembly. Tighten the nuts (9).

193. Sub-Surface Rail Extension Assembly

A sub-surface rail extension assembly is attached to the loading rack support on each side of the elevator pit.

a. Removal. Remove the sub-surface rail extension assembly (4, fig. 286) as required.

b. Disassembly.

(1) Disassemble the extension assembly.

(2) Remove and disassemble the switch actuator arm (8, fig. 284) and the switch mounting bracket (16, fig. 284).

c. Assembly.

(1) Assemble and install the switch mounting bracket (16, fig. 284) and assemble and position the switch actuator arm (8, fig. 284).

(2) Install the springs (6 and 7, fig. 284) and the spring pins (1, fig. 284).

(3) Adjust the setscrews (10, fig. 284) to position the switch actuator arm 1⅜ inch from the tee track of the extension assembly. Tighten the nuts (9, fig. 284).

(4) Assemble the extension assembly (4, fig. 286).

d. Installation.

(1) Position the extension assembly and install the headless angle pins (1, fig. 286).

(2) Trim the track section of the extension assembly to clear the rail extension assembly (fig. 285).

Note. Clearance must not exceed ½ inch.

(3) Install the extension assembly (fig. 286).

194. Mounting Brackets

Six mounting brackets (fig. 287) are used to support the launcher base assembly. Typical removal and installation procedures for one set of the six brackets are described in *a* and *b* below.

Warning: **Before disconnecting or connecting any external power cables, turn off the section generator. Voltages DANGEROUS TO LIFE are present when the section generator is operating.**

a. Removal.

(1) *Launcher No. 1.*

(*a*) Attach the multiple leg slings to the intermediate lifting lugs on launcher No. 1 (B, fig. 269) using the attached toggle pins.

(*b*) Remove the hexagon nuts, lockwashers, and square flat washers (fig. 287) from the anchor bolts at each mounting bracket.

(*c*) Turn off the section generator.

(*d*) Disconnect the cable assemblies (fig. 271) from the power distribution box assembly and the launcher base assembly.

(*e*) Remove the loading rack adapter assemblies (fig. 283).

(*f*) Using a hoisting device capable of lifting a minimum of 12,500 pounds, attach the multiple leg slings (fig. 287) to the lifting hook, and raise the launcher base assembly until the front, intermediate, and rear mounting brackets are clear of the anchor bolts.

(*g*) Remove the front, intermediate, or rear mounting brackets (fig. 288) as required.

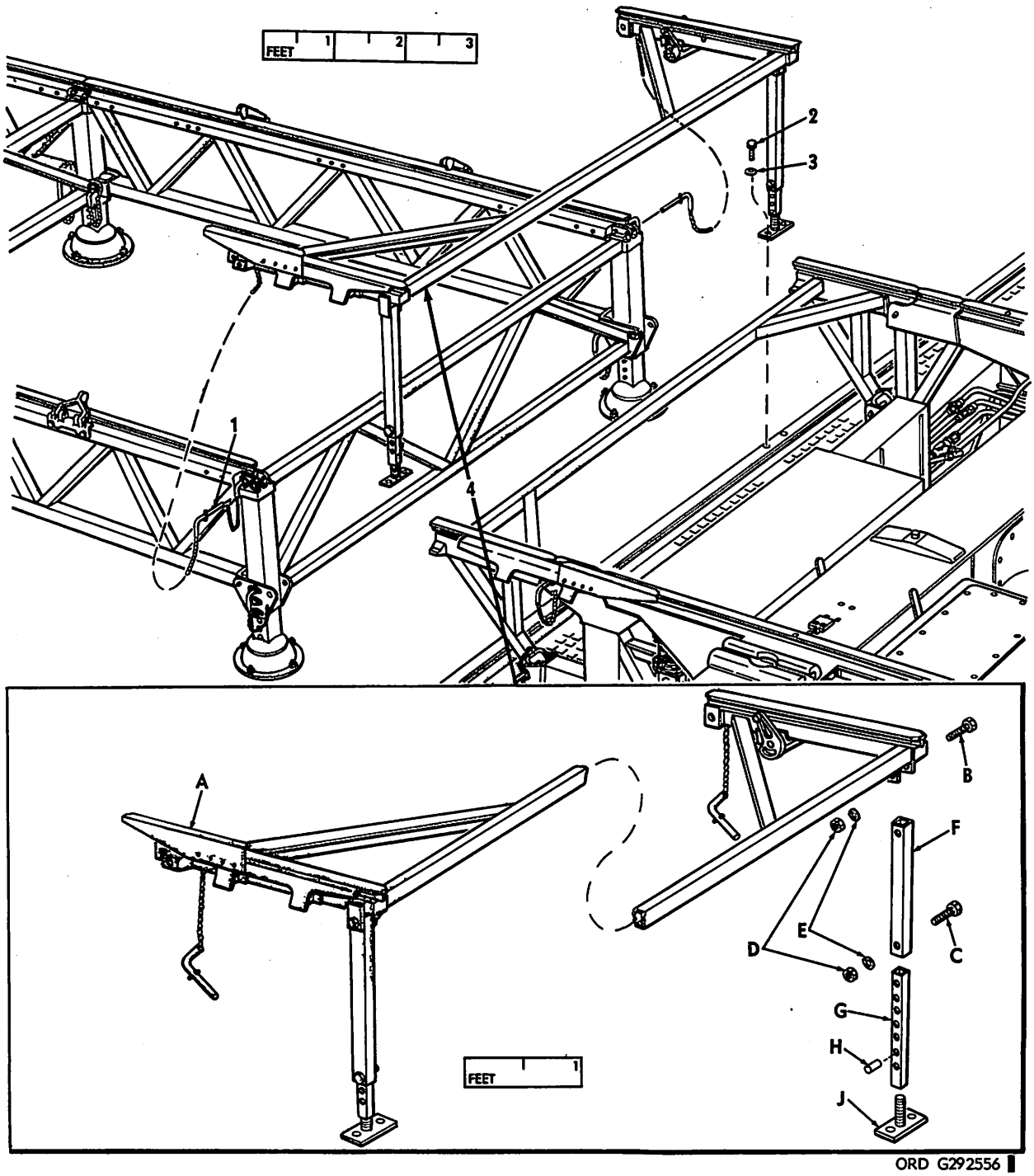
(2) *Launcher No. 2.*

(*a*) Attach the multiple leg slings (fig. 287) to the intermediate lifting lugs on launcher No. 2 (G, fig. 269) using the attached toggle pins. Perform steps (1) (*b*) through (*d*) above.

(*b*) Make certain that the launchers No. 2 and No. 3 globe valves and launchers No. 2 and No. 3 MISSILE HYDRAULIC SHUT–OFF valves are closed.

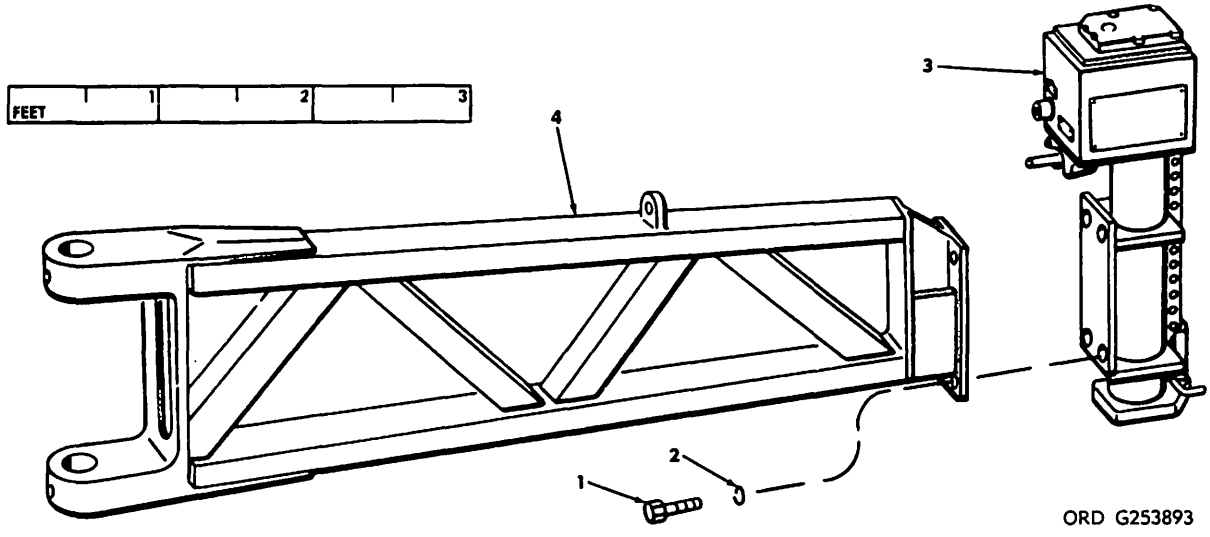
(*c*) Disconnect and remove the two tube assemblies (fig. 289) on the right side of launcher No. 2; cap all open lines.

(*d*) Disconnect and remove the two tube assemblies (fig. 289) on the left side



1—Headless angle pin (2).
2—⅜-16 x 1¼ hex-hd cap screw 122145 (4)
3—⅜ lockwasher MS35338-27 (4)
4—Sub-surface rail extension assembly 9032729 (right) or 9032728 (left)
A—Switch actuator arm 9977519-1 (right) or 9977519-2 (left)
B—⅞-14 x 3 7/16 hex-hd bolt AN14-32A (2)
C—⅞-14 x 2 13/16 hex-hd bolt AN14-25A (2)
D—⅞-14 hex. nut MS35690-1422 (4)
E—⅞ lockwasher MS35338-90 (4)
F—Casing 8167727 (2)
G—Extension 8167726 (2)
H—0.375 dia x 1.375 spg pin MS9048-297 (2)
J—1-14 x 5¼ plate-hd screw 8167725 (2)

Figure 286. Sub-surface rail extension assembly—removal, disassembly, assembly, and installation—typical.



1—⅝–18 x 1¼ cap screw MS35298–160 (4)
2—⅝ lockwasher MS35338–50 (4)
3—Jack 9152501
4—Outrigger

Figure 318.10. Outrigger jack—removal and installation.

(1) Drain and discard the hydraulic oil by extending the oil level indicator (12) to its fullest extent and inverting the jack.

Caution: **Care should be exercised during removal of the cylinder head (5) to prevent damage to the head gasket (6).**

(2) Remove the cylinder head and the head gasket.
(3) Remove and discard the preformed packing (7).
(4) Remove the baffle (9) and the breather (10) from the cylinder head.
(5) Remove the oil level indicator retainer (11) from the oil level indicator (12). Remove the indicator and remove and discard the preformed packing (13).
(6) Remove the tube (14).
(7) Remove the chain assembly (15).
(8) Loosen the setscrew (16) enough to remove the hexagon-head bolt (17). Remove the hexagon-head bolt (18), self-locking hexagon nut (19), and flat washer (20), and remove the locking bar (21) and the stop (22).
(9) Remove the adapter (24) by loosening the setscrews (23) and turning the adapter counterclockwise.
(10) Remove the clamp (28) and the bellows (29).
(11) Remove the piston (30) by using the jack ram inserter (1, fig. 55.1). Exert a gentle force on the handle of the jack ram inserter and force the piston upward until it protrudes three inches above the top of the jack. Pull the piston the remaining distance to complete the removal.
(12) Remove and retain the retaining ring (31) and the scraper ring (32).
(13) Remove and discard the preformed packings (33 and 34).

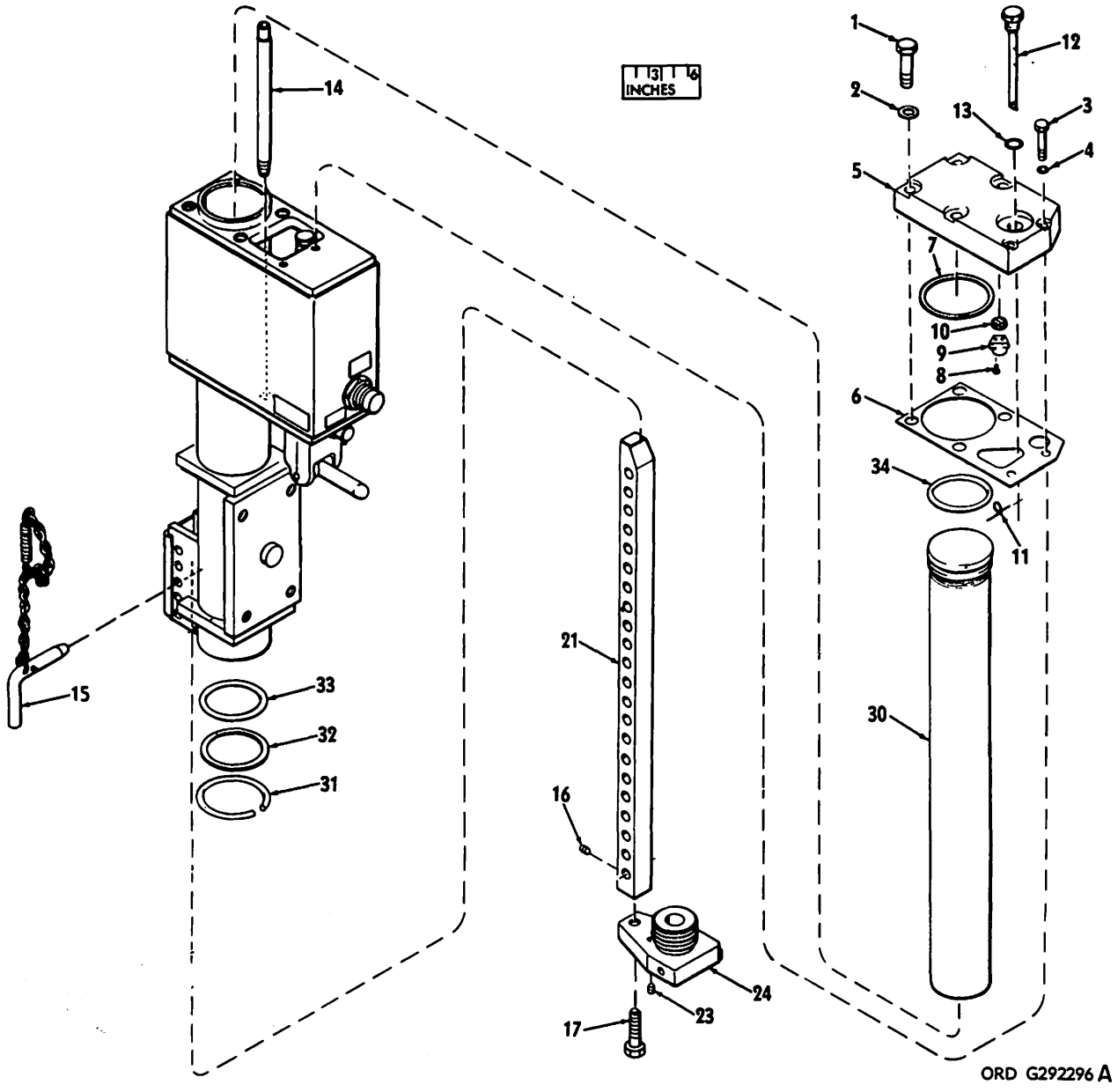
Note. The key numbers shown in parentheses in steps (14) and (15) below refer to figure 318.3.

(14) Remove the relief valve (1), control valve (9), and hydraulic pump (13).
(15) Remove and discard the preformed packings (2, 10, and 14).
(16) Disassemble the relief valve (fig. 318.4), control valve (fig. 318.5), and hydraulic pump (fig. 318.6).

c. Assembly.

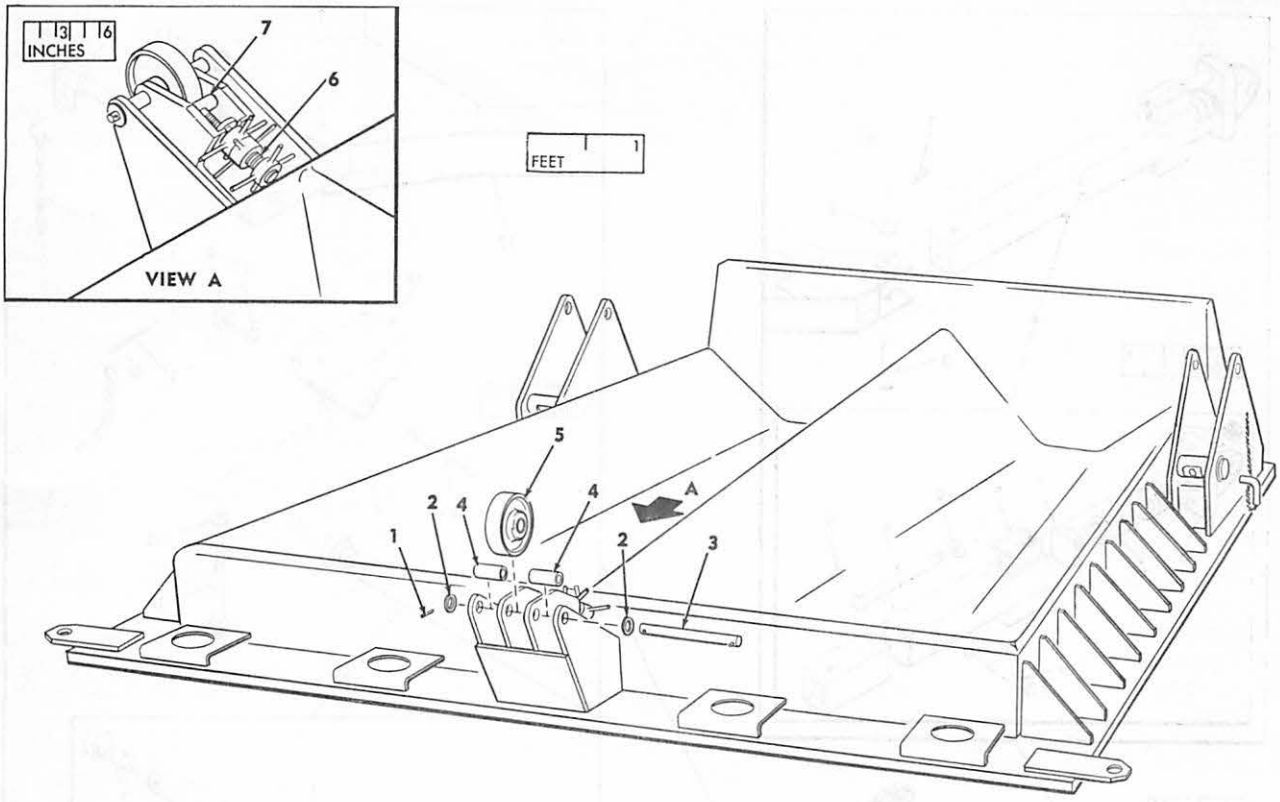
Caution: **Dip new preformed packings in clean hydraulic oil before installation.**

Note. **Replace old preformed packings with new packings.**



1—5/8–18 x 2 1/64 hex-hd bolt AN10C17A (4)
2—5/8 fl washer AN960PD1016 (4)
3—5/16–24 x 1 19/32 hex-hd bolt AN5C14A (2)
4—5/16 fl washer AN960PD516 (2)
5—Cylinder head 9153465
6—Head gasket 9152630
7—Preformed packing AN6230–19
8—No. 00 x 3/16 rd-hd dr screw MS21318–2 (2)
9—Baffle 9978460
10—Breather 9152592
11—Oil level indicator retainer 9153625 (p/o oil level indicator 9153627)
12—Oil level indicator 9153627
13—Preformed packing MS28778–10
14—Tube 9152624
15—Chain assembly 9978466–1
16—5/16–24 x 3/8 cone-pt setscrew MS51035–56
17—1/2–20 x 1 15/32 hex-hd bolt AN8–13A
18—(Deleted)
19—(Deleted)
20—(Deleted)
21—Locking bar 9152615
22—(Deleted)
23—5/16–24 x 5/8 cone-pt setscrew MS51035–58 (2)
24—Adapter 9153499
25—(Deleted)
26—(Deleted)
27—(Deleted)
28—(Deleted)
29—(Deleted)
30—Piston 9152610
31—Retaining ring 9026924
32—Scraper ring MS28776–31
33—Preformed packing AN6227–42
34—Preformed packing AN6227–41

Figure 318.10.1. Outrigger jack—disassembly and assembly.



1 — 0.125 x 1.125 spring pin NAS561P-4-18 (2)
2 — 0.812-inch-id flat washer MS15795-222
3 — Steel bar 18355-9032583-161
4 — Sleeve spacer NAS43HT-12-148
5 — Wheel 9151204
6 — Wheel retainer arm
7 — Retainer

Figure 319. Disassembly and assembly of deflector assembly.

(3) *Assembly.*

(*a*) Clean bearing bores of arm assembly (fig. 320) and treat for prevention of corrosion. Refer to TM 9-1400-250-35 for cleaning and corrosion prevention treatment.

(*b*) Install bearings (2, fig. 320) and secure with retaining rings (1, fig. 320).

(*c*) Install lubrication fittings (3, fig. 320).

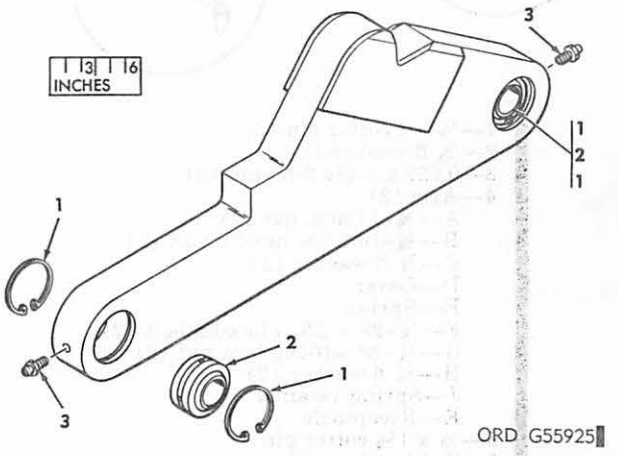
(4) *Installation.*

(*a*) Install wheel retainer arm (6, fig. 319) and retainer (7, fig. 319) as shown in TM 9-1440-251-10.

(*b*) Install arm assemblies (2) as shown in TM 9-1440-251-10.

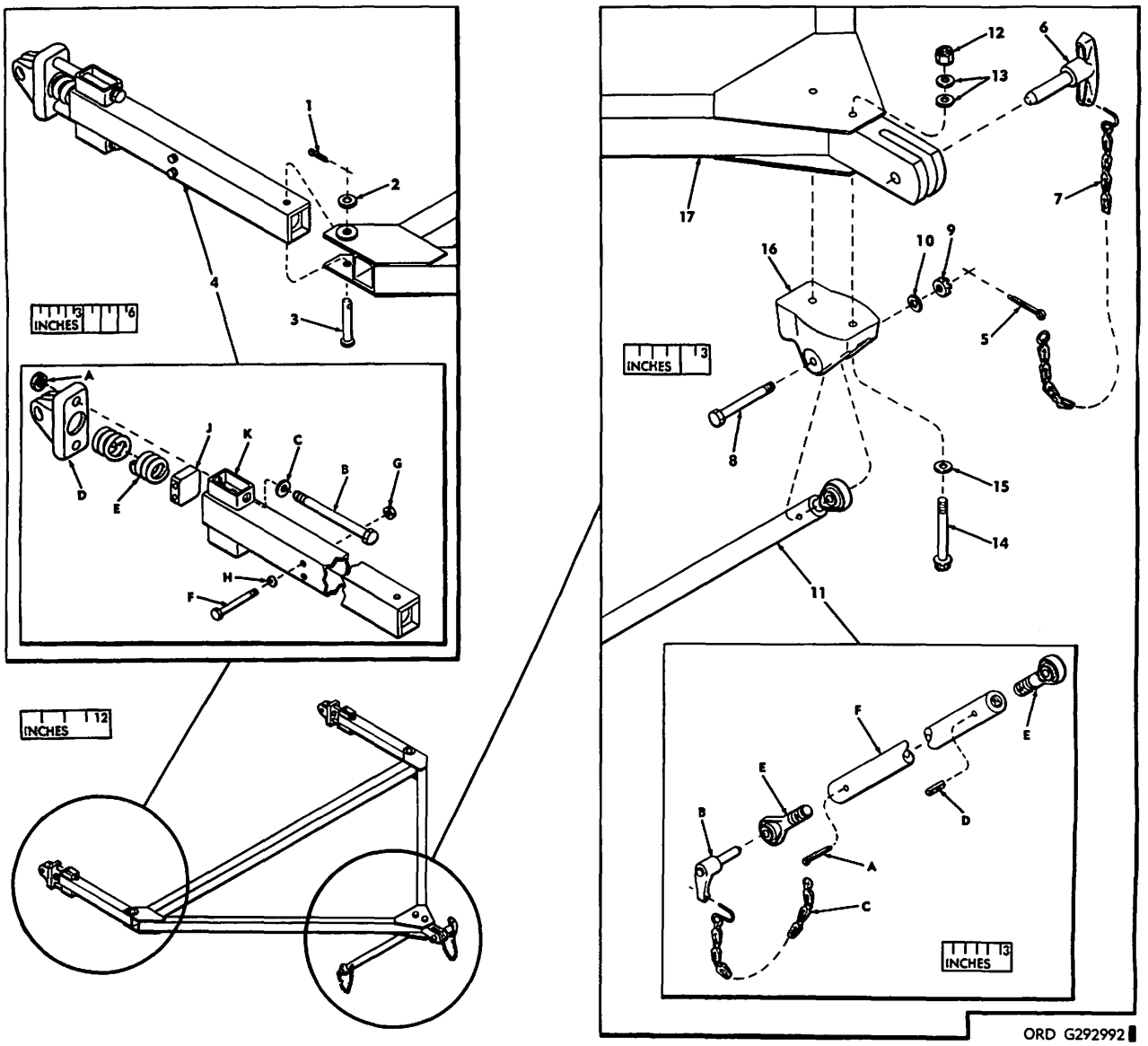
(*c*) Install rods (3) as shown in TM 9-1440-251-10.

(*d*) Install ratchet wrenches (4) as



1 — Retaining ring NAS669-237
2 — Bearing 9151203
3 — Lubrication fitting 9018840

Figure 320. Disassembly and assembly of arm assembly.



1—⅛ x 1 cotter pin (2)
2—⅝ fl washer (2)
3—0.622 x 3.484 fl-hd pin (2)
4—Arm (2)
A—¾-16 hex. nut (2)
B—¾-16 x 7⅝ hex-hd bolt (2)
C—¾ fl washer (2)
D—Cover
E—Spring
F—¼-28 x 2.925 hex-hd bolt (2)
G—¼-28 self-lkg hex. nut (2)
H—¼ fl washer (2)
J—Spring retainer
K—Receptacle
5—⅛ x 1½ cotter pin
6—Quick-release pin
7—Chain
8—¾-16 x 3 17/32 hex-hd bolt
9—¾-16 castellated hex. nut
10—¾ fl washer
11—Retainer
A—3/16 x 1¾ cotter pin
B—Quick-release pin
C—Chain
D—3/16 x 1½ spg pin
E—Rod end
F—Link
12—⅝-18 self-lkg hex. nut (2)
13—⅝ fl washer (4)
14—⅝-18 x 4.419 machine bolt (2)
15—⅝ recessed washer (2)
16—Bracket
17—Frame

Figure 321. Blast deflector positioner—disassembly and assembly.

shown in TM 9–1440–251–10.

(*e*) Refer to LO 9–1400–250–20 for lubrication of the arm assemblies.

b. Blast Shield (73 and Subsequent).

(1) *Removal.*

(*a*) Remove the blast deflector positioner (12) as shown in TM 9–1440–251–10.

(*b*) Remove the ratchet wrenches (10) as shown in TM 9–1440–251–10.

(*c*) Remove the rods (9) as shown in TM 9–1440–251–10.

(*d*) Remove the arm assemblies (8) as shown in TM 9–1440–251–10.

(2) *Disassembly.*

(*a*) Disassemble the blast deflector positioner (fig. 321).

(*b*) Disassemble the arm assembly (fig. 320).

(3) *Assembly.*

(*a*) Assemble the arm assembly (fig. 320) as described in *1* through *3* below.

1. Clean the bearing bores of the arm assembly and treat for prevention of corrosion. Refer to TM 9–1400–250–35 for cleaning and corrosion prevention treatment.

2. Install the bearings and secure with the retaining rings.

3. Install the lubrication fittings.

(*b*) Assemble the blast deflector positioner (fig. 321).

(4) *Installation.*

(*a*) Install the arm assemblies (8) as shown in TM 9–1440–251–10.

(*b*) Install the rods (9) as shown in TM 9–1440–251–10.

(*c*) Install the ratchet wrenches (10) as shown in TM 9–1440–251–10.

(*d*) Install the blast deflector positioner (12) as shown in TM 9–1440–251–10, if required.

(*e*) Refer to LO 9–1400–250–20 for lubrication of the arm assemblies.